

EPA Enforcement: National Petroleum Refinery Initiative



Petroleum Refinery Initiative

Four Program Areas — Sources of Refinery Emissions (“Marquee” Issues)

- **New Source Review/Prevention of Significant Deterioration (NSR/PSD)**
 - Fluidized Catalytic Cracking Units (FCCUs)
 - Heaters and Boilers
- **New Source Performance Standards (NSPS)**
 - Flares
 - Sulfur Recovery Units
 - Fuel Gas Combustion Devices (including heaters & boilers)
- **Leak Detection and Repair (LDAR)**
- **Benzene**



Refinery National Strategy

- **Goal: By the end of FY 05, coverage of 80% of domestic refining capacity (by settlement for all “marquee” issues, filed civil action or referral to the Department of Justice)**
- **Goal: Address 90% of domestic refining capacity located in environment justice areas**
- **National Priority:**
 - Will file cases against those who do not settle
 - Will level the playing field

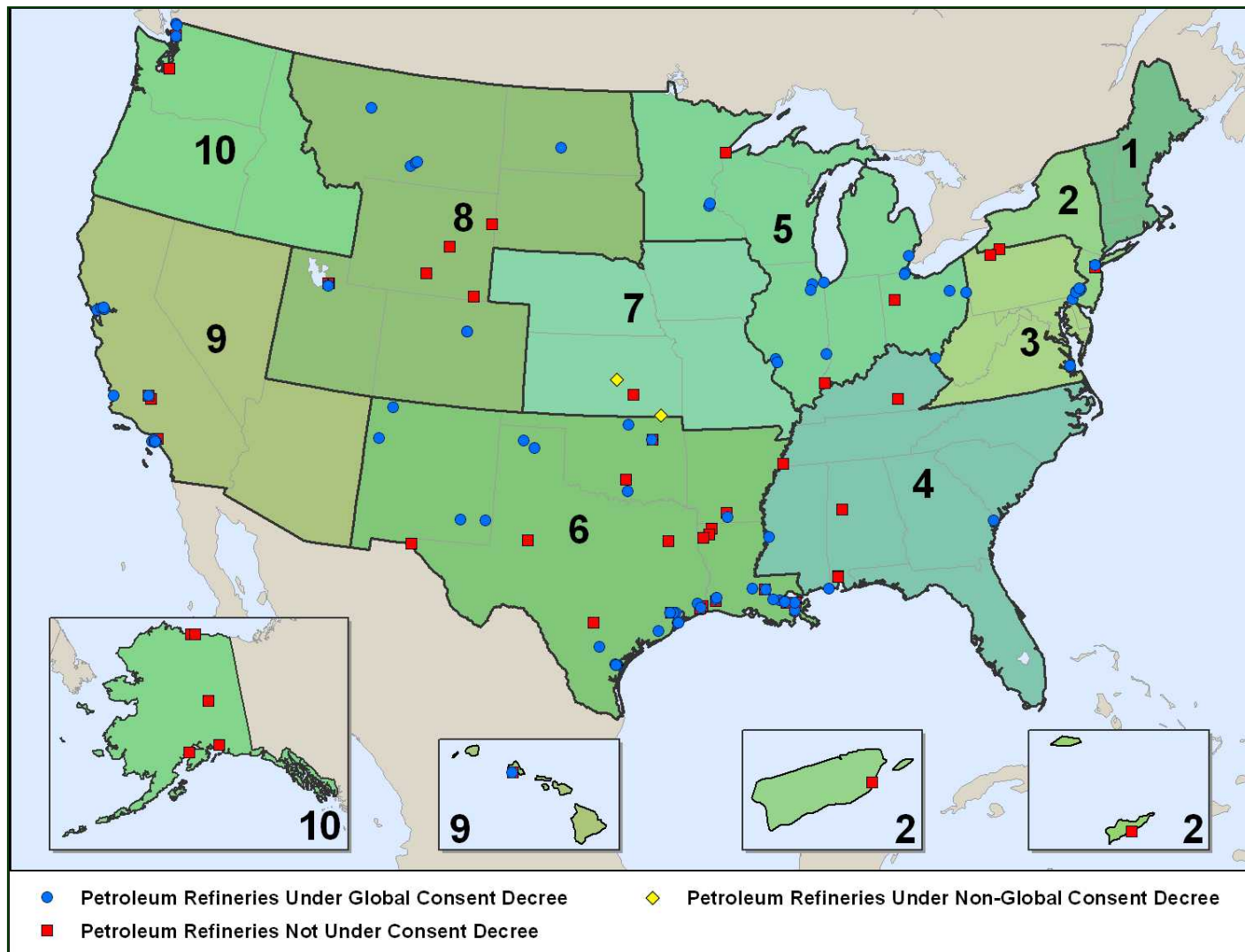


Refinery National Strategy

- **As of October 2005**
 - **Approximately 77% of the nation's refinery capacity is under lodged or entered "global" settlements ("global" settlements address marquee issues at refineries company-wide)**
 - 17 refiners
 - 85 refineries
 - \$4.4 billion in capital costs for new control technologies
 - \$63 million in civil penalties
 - \$60 million in environmental projects (such as the installation of additional controls and equipment to further reduce refinery emissions, emergency response equipment for local communities, and wildlife habitat restoration)
 - Located in 25 states
 - **Emissions reductions from FCCUs, sulfur recovery units, heaters and boilers, flares:**
 - 80,000 tpy NO_x
 - 235,000 tpy SO₂

(estimated annual reductions when all current settlements are fully implemented)

U.S. Petroleum Refineries



Updated 03/21/06 - Subject to Revision



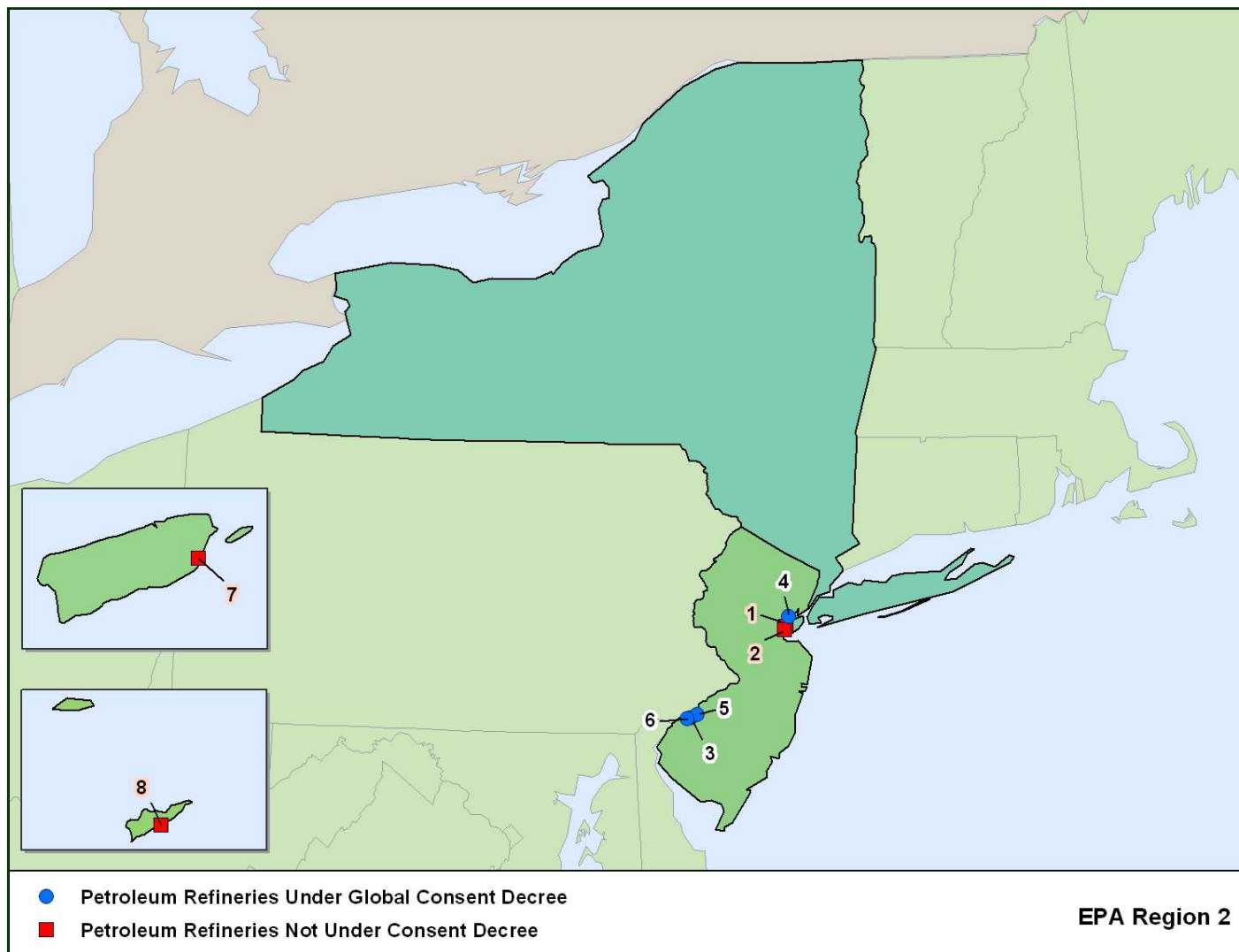
U.S. Petroleum Refineries

National Crude Petroleum Refining Capacity			
EPA Region	Crude Refining Capacity under CD	Total Crude Refining Capacity	Percent of Capacity under CD
Region 1	No petroleum refineries are located in Region 1		
Region 2	638,000	1,348,500	47
Region 3	958,300	1,035,000	93
Region 4	598,000	941,725	64
Region 5	2,103,200	2,321,450	91
Region 6	6,778,987	8,289,019	82
Region 7	182,200	292,200	62
Region 8	466,700	632,200	74
Region 9	1,897,300	2,092,300	91
Region 10	244,600	996,275	25
U.S. Total	13,867,287	17,948,669	77

Capacity data from Oil & Gas Journal's 2005 Worldwide Refining Survey, December 19, 2005, except as noted on following Region slides.

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Region 2 Petroleum Refineries



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Region 2 Petroleum Refineries

Refineries under CD

New Jersey

3. Citgo Asphalt Refining Co. – Paulsboro – 84,000
4. ConocoPhillips – Bayway – 238,000
5. Sunoco Inc. – Eagle Point – 150,000
6. Valero Energy Corp. – Paulsboro – 166,000

Refineries not under CD

New Jersey

1. Amerada Hess – Port Reading – 62,500 (FCCU capacity)
2. Chevron Corp. – Perth Amboy – 80,000

Puerto Rico

7. Shell Chemical Yabucoa Inc. – Yabucoa – 73,000

U.S. Virgin Islands

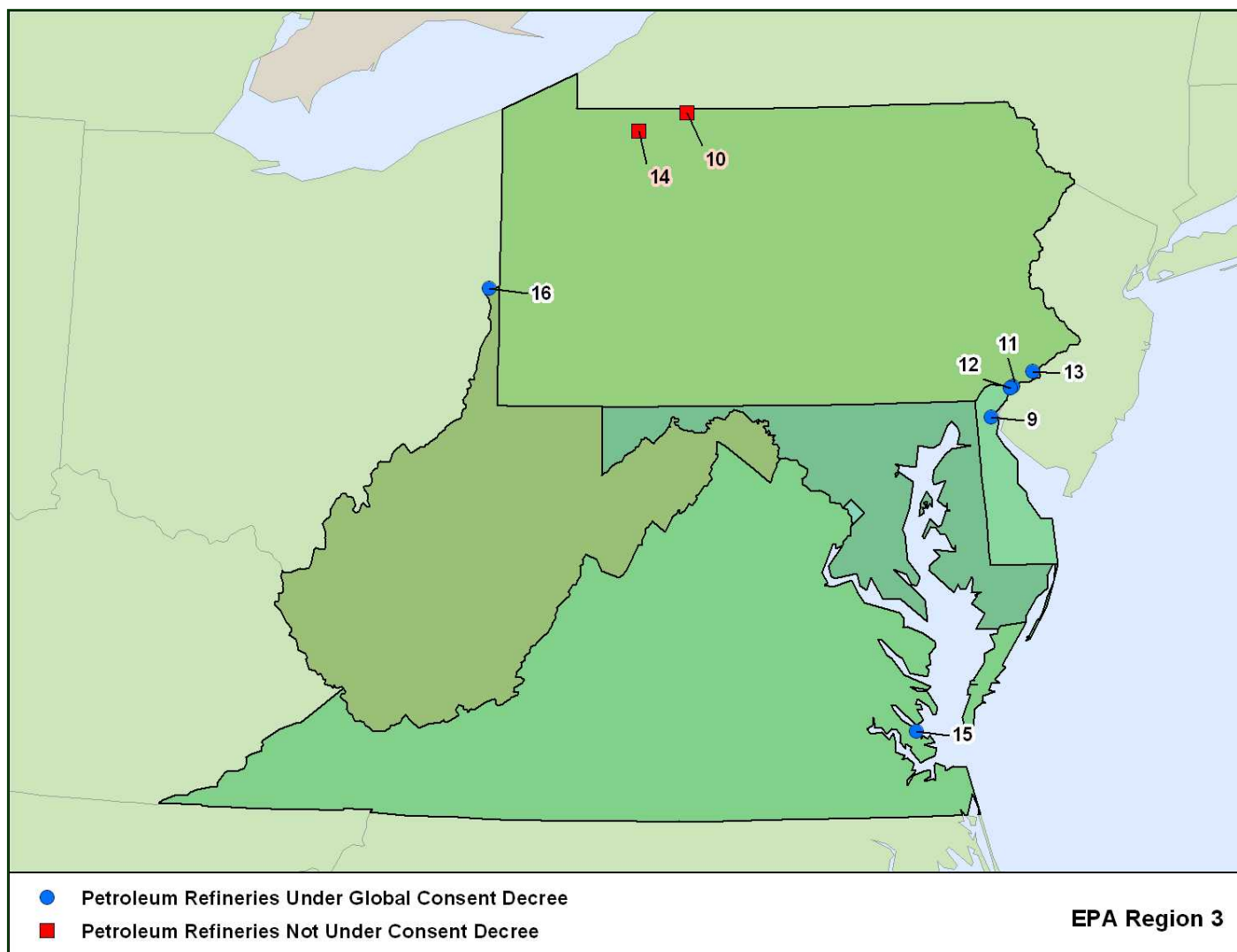
8. Hovensa LLC – St. Croix – 495,000

By state: Number on map, Company, Refinery, Crude oil capacity (barrels/day)

Data from Oil & Gas Journal's 2005 Worldwide Refining Survey, December 19, 2005, except:

1. NPRA Refining Capacity Report 2005
2. January 2006 EIA Petroleum Profile for New Jersey
3. Citgo press release dated 11/28/2004

Region 3 Petroleum Refineries



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Region 3 Petroleum Refineries

Refineries under CD

Delaware

9. Valero Energy Corp.– Delaware City
190,000

Pennsylvania

11. ConocoPhillips – Trainer – 185,000
12. Sunoco Inc.– Marcus Hook – 175,000
13. Sunoco Inc. – Philadelphia – 330,000

Virginia

15. Giant Refining Company – Yorktown –
58,900

West Virginia

16. Ergon-West Virginia, Inc. – Newell –
19,400

Refineries not under CD

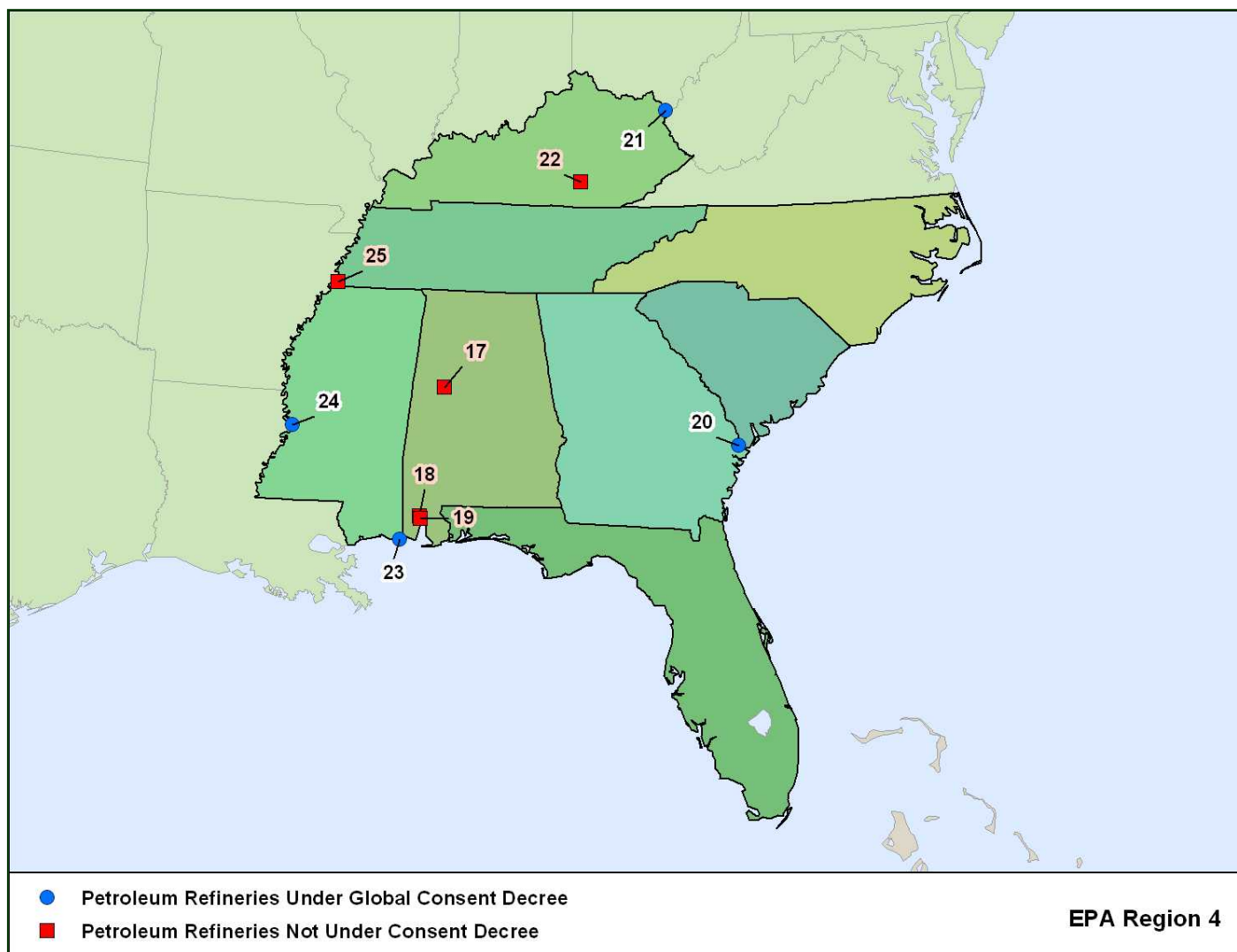
Pennsylvania

10. American Refining Group –
Bradford – 10,000

14. United Refining Co. – Warren –
66,700

By state: Number on map, Company, Refinery, Crude oil capacity (barrels/day)
Data from Oil & Gas Journal's 2005 Worldwide Refining Survey, December 19, 2005

Region 4 Petroleum Refineries



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Region 4 Petroleum Refineries

Refineries under CD

Georgia

20. Citgo Asphalt Refining Co. –
Savannah – 28,000

Kentucky

21. Marathon Petroleum Company LLC
– Catlettsburg – 222,000

Mississippi

23. Chevron Corp. – Pascagoula –
325,000

24. Ergon Refining Inc. – Vicksburg –
23,000

Refineries not under CD

Alabama

17. Hunt Refining Company –
Tuscaloosa – 43,225

18. Shell Chemical Company – Saraland
– 85,000

19. Trigeant Petroleum – Mobile Bay –
20,000

Kentucky

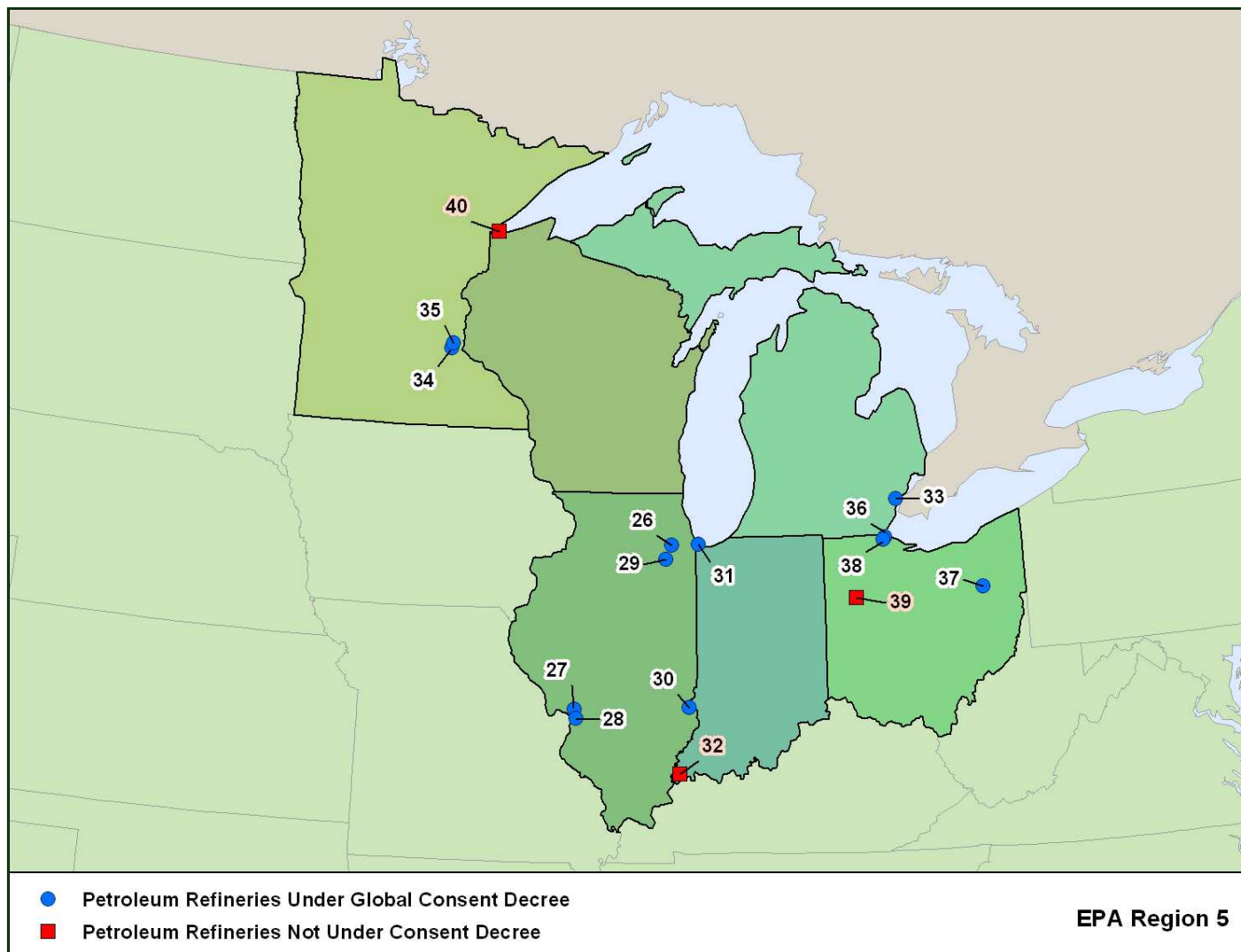
22. Somerset Refinery Inc. – Somerset
– 5,500

Tennessee

25. Valero Energy Corp. – Memphis –
190,000

By state: Number on map, Company, Refinery, Crude oil capacity (barrels/day)
Data from Oil & Gas Journal's 2005 Worldwide Refining Survey, December 19, 2005, except:
20. Citgo press release dated 11/28/2004

Region 5 Petroleum Refineries



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Region 5 Petroleum Refineries

Refineries under CD

Illinois

- 26. Citgo Petroleum Corp. – Lemont – 158,650
- 27, 28. ConocoPhillips – Wood River and Distilling West – 306,000
- 29. ExxonMobil Refining and Supply Co. – Joliet – 238,000
- 30. Marathon Petroleum Company LLC – Robinson – 192,000

Indiana

- 31. BP PLC – Whiting – 399,000

Michigan

- 33. Marathon Petroleum Company LLC – Detroit – 100,000

Minnesota

- 34. Flint Hills Resources – Pine Bend – 279,300
- 35. Marathon Petroleum Company LLC – St. Paul Park – 70,000

Ohio

- 36. BP PLC – Toledo – 147,250
- 37. Marathon Petroleum Company LLC – Canton – 73,000
- 38. Sunoco Inc. – Toledo – 140,000

Refineries not under CD

Indiana

- 32. Countrymark Cooperative Inc. – Mount Vernon – 23,500

Ohio

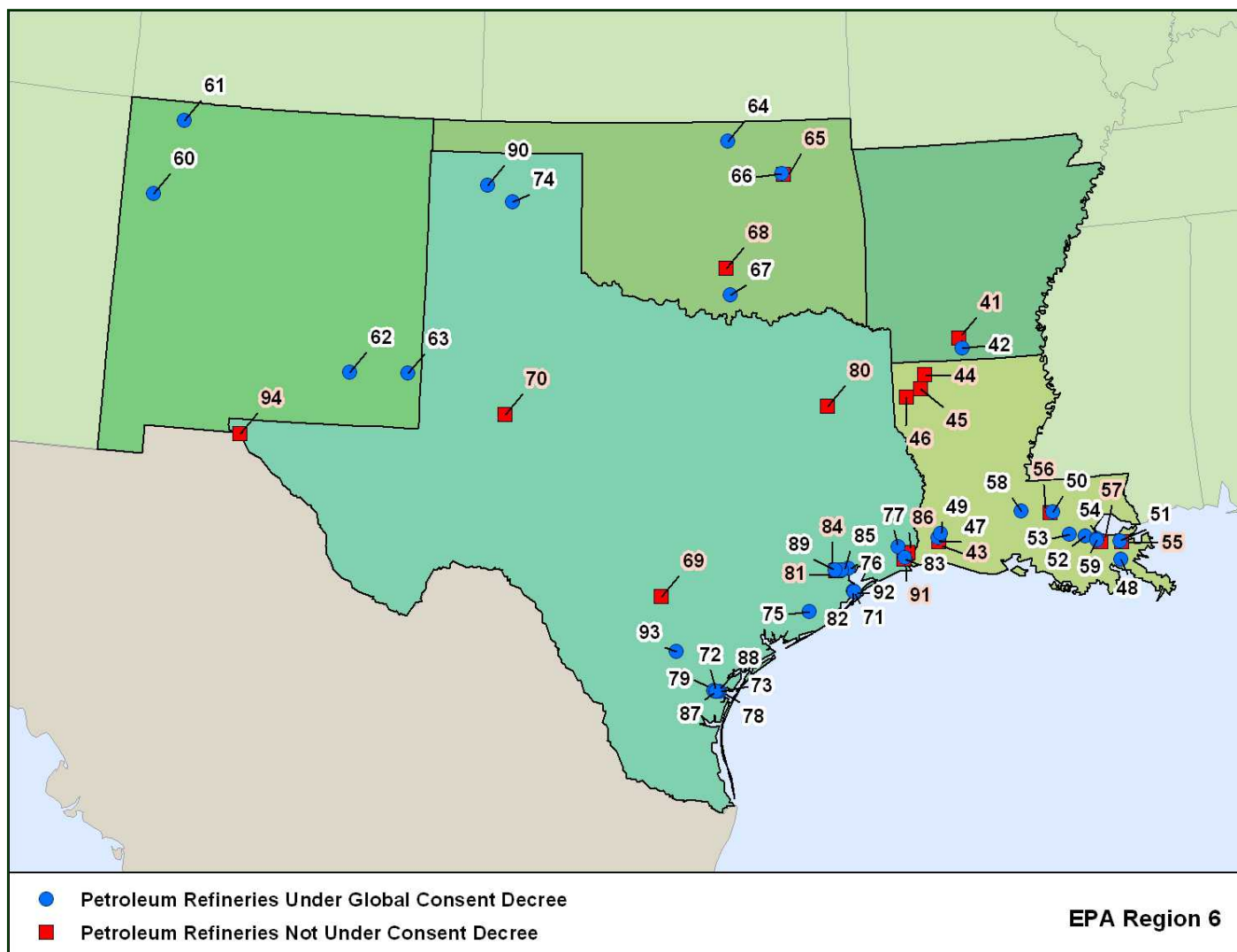
- 39. Valero Energy Corp. – Lima – 161,500

Wisconsin

- 40. Murphy Oil USA Inc. – Superior – 33,250

By state: Number on map, Company, Refinery,
Crude oil capacity (barrels/day)
Data from Oil & Gas Journal's 2005 Worldwide
Refining Survey, December 19, 2005

Region 6 Petroleum Refineries



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Region 6 Petroleum Refineries

Refineries under CD

Arkansas

42. Lion Oil Company – El Dorado – 70,000

Louisiana

47. Citgo Petroleum Corp. – Lake Charles – 440,000

48. ConocoPhillips – Alliance – 247,000

49. ConocoPhillips – Lake Charles – 239,000

50. ExxonMobil Refining and Supply Co. – Baton Rouge – 501,000

51. ExxonMobil Refining and Supply Co. – Chalmette – 188,000

52. Marathon Petroleum Company LLC – Garyville – 245,000

53. Motiva Enterprises LLC – Convent – 235,000

54. Motiva Enterprises LLC – Norco – 220,000

58. Valero Energy Corp. – Krotz Springs – 83,100

59. Valero Energy Corp. – St. Charles – 186,000

New Mexico

60. Giant Refining Company – Ciniza – 26,000

61. Giant Refining Company – Bloomfield – 18,600

62, 63. Navajo Refining Company – Artesia and Lovington – 60,000

Oklahoma

64. ConocoPhillips – Ponca City – 187,000

66. Sunoco Inc. – Tulsa – 85,000

67. Valero Energy Corp. – Armore – 87,877

Texas

71. BP PLC – Texas City – 446,500

72, 73. Citgo Petroleum Corp. – Corpus Christi East and West Plants – 156,750

74. ConocoPhillips – Borger – 146,000

75. ConocoPhillips – Sweeny – 247,000

76. ExxonMobil Refining and Supply Co. – Baytown – 563,000

77. ExxonMobil Refining and Supply Co. – Beaumont – 348,500

78, 79. Flint Hills Resources – Corpus Christi East and West Plants – 279,300

82. Marathon Petroleum Company LLC – Texas City – 72,000

83. Motiva Enterprises LLC – Port Arthur – 285,000

85. Shell Deer Park Refining Co. – 333,700

87, 88. Valero Energy Corp. – Corpus Christi East and West Plants – 205,000

89. Valero Energy Corp. – Houston – 90,000

90. Valero Energy Corp. – McKee – 166,660

92. Valero Energy Corp. – Texas City – 225,000

93. Valero Energy Corp. – Three Rivers – 96,000



Region 6 Petroleum Refineries

Refineries not under CD

Arkansas

41. Cross Oil and Refining Company –
Smackover – 7,000

Louisiana

43. Calcasieu Refining Co. – Lake Charles –
15,680
44. Calumet Lubricants Co. – Cotton Valley –
9,500
45. Calumet Lubricants Co. – Princeton –
9,500
46. Calumet Lubricants Co. – Shreveport
35,000
55. Murphy Oil USA Inc. – Meraux – 125,000
56. Placid Refining Co. LLC – Port Allen –
55,000
57. Shell Chemical Company – St. Rose –
55,000

Oklahoma

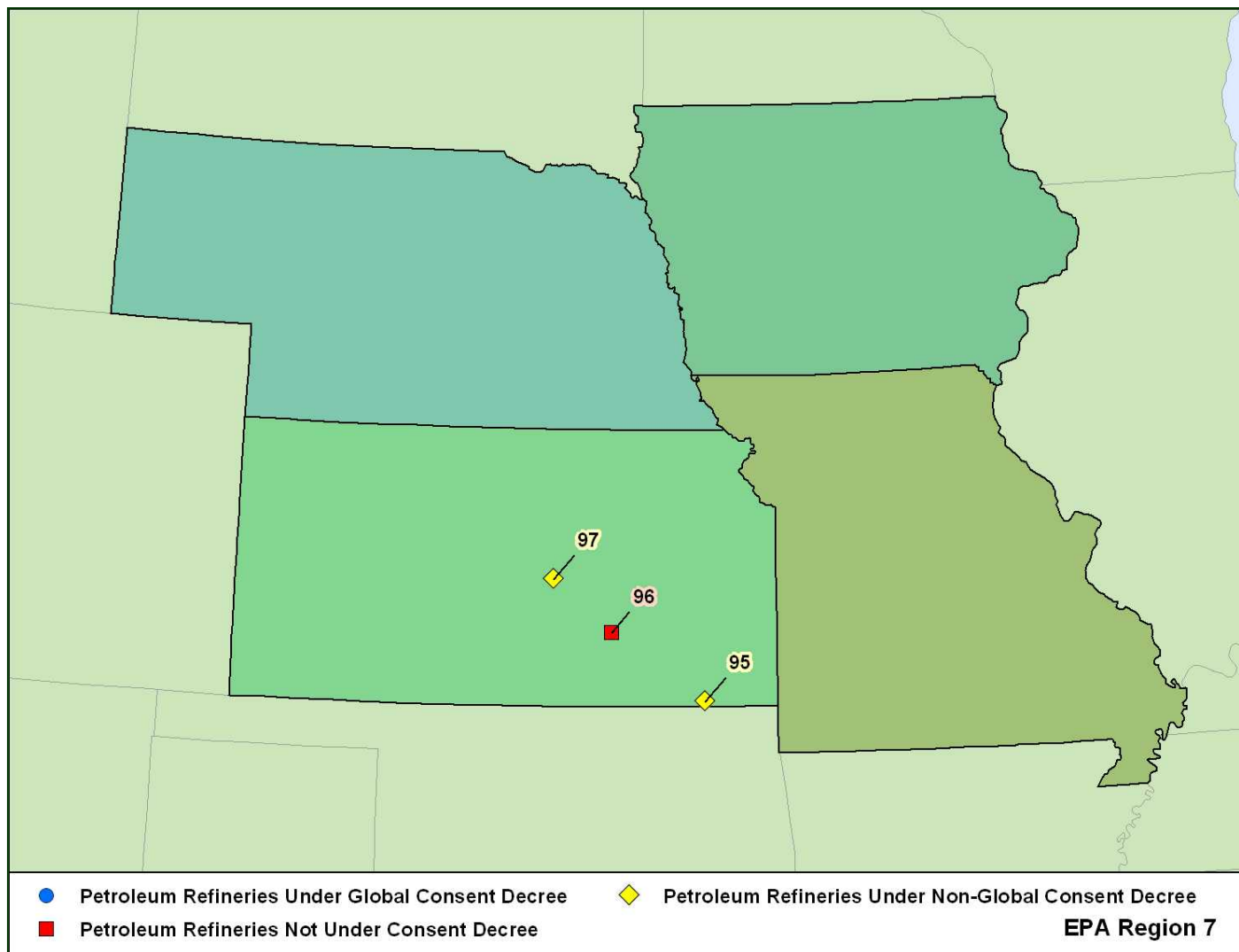
65. Sinclair Oil Corp. – Tulsa – 50,000
68. Wynnewood Refining Co. – Wynnewood –
52,500

Texas

69. AGE Refining And Manufacturing – San
Antonion – 12,000
70. Alon USA – Big Spring – 70,000
80. LaGloria Oil and Gas Co. – Tyler – 60,000
81. Lyondell-Citgo Refining LP – Houston –
282,600
84. Pasadena Refining System – 100,000
86. Total SA – Port Arthur – 231,252
91. Valero Energy Corp. – Port Arthur –
250,000
94. Western Refining Inc. – El Paso – 90,000

By state: Number on map, Company, Refinery,
Crude oil capacity (barrels/day)
Data from Oil & Gas Journal's 2005 Worldwide
Refining Survey, December 19, 2005

Region 7 Petroleum Refineries



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Region 7 Petroleum Refineries

Refineries under global CD

None

Refineries not under CD

Kansas

96. Frontier – El Dorado – 110,000

Refineries under non-global CD

Kansas

**95. Coffeyville Resources Refining &
Marketing – Coffeyville – 100,000**

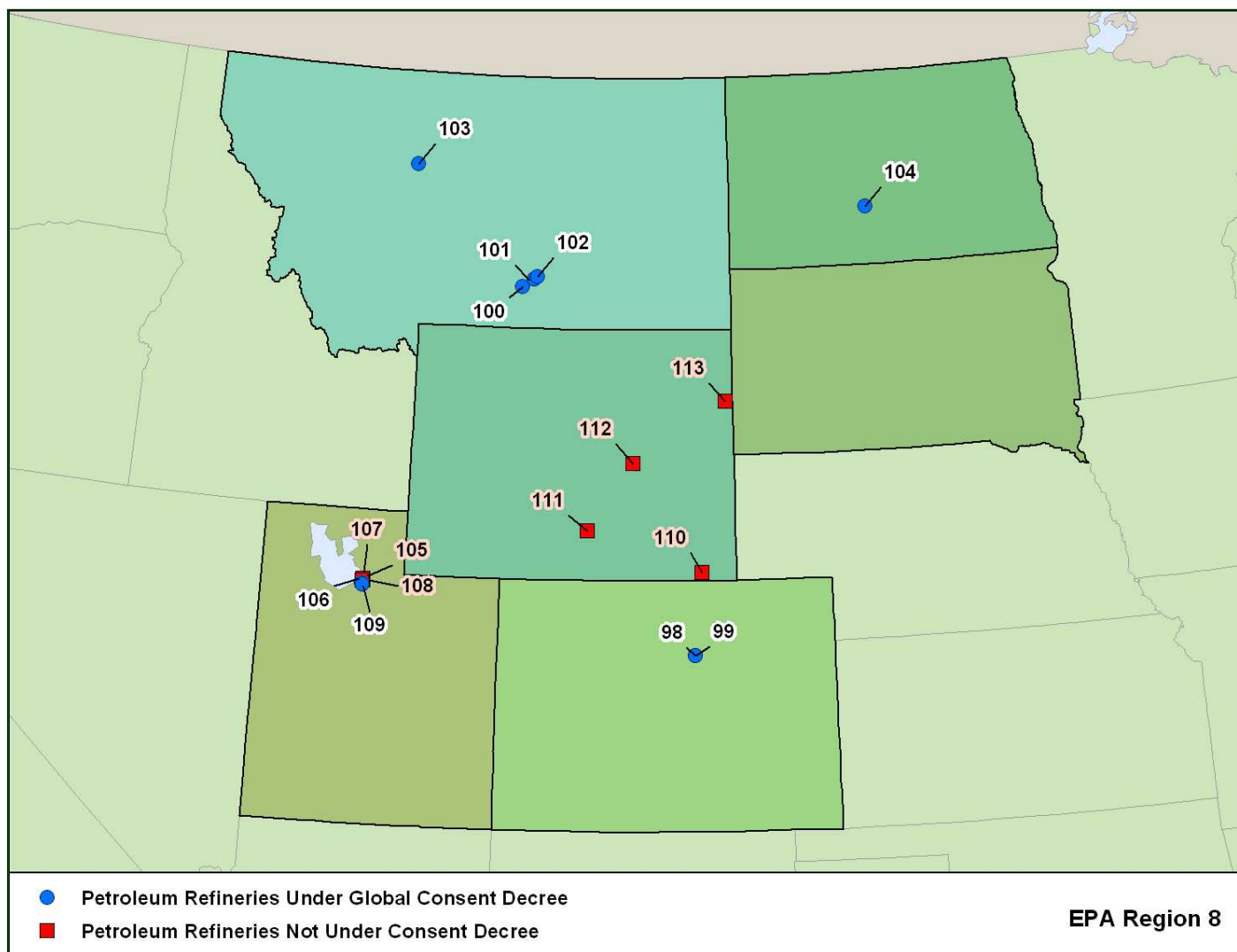
**97. National Cooperative Refining
Association – McPherson – 82,200**

Note:

Coffeyville Resources Refining & Marketing and National Cooperative Refining Association are both under consent decrees with the United States and the State of Kansas that cover some, but not all, of the marquee issues of the National Petroleum Refinery Initiative.

By state: Number on map, Company, Refinery, Crude oil capacity (barrels/day)
Data from Oil & Gas Journal's 2005 Worldwide Refining Survey, December 19, 2005

Region 8 Petroleum Refineries



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Region 8 Petroleum Refineries

Refineries under CD

Colorado

- 98. Suncor Energy Products – Denver West Plant – 92,000
- 99. Suncor Energy Products – Denver East Plant – 28,000

Montana

- 100. Cenex Harvest States – Laurel – 57,500
- 101. ConocoPhillips – Billings – 58,000
- 102. ExxonMobil Refining and Supply Co. – Billings – 60,000
- 103. Montana Refining Company – Great Falls – 8,200

North Dakota

- 104. Tesoro West Coast Co. – Mandan – 58,000

Utah

- 106. Chevron Corp. – Salt Lake City – 45,000
- 109. Tesoro West Coast Co. – Salt Lake City – 60,000

Refineries not under CD

Utah

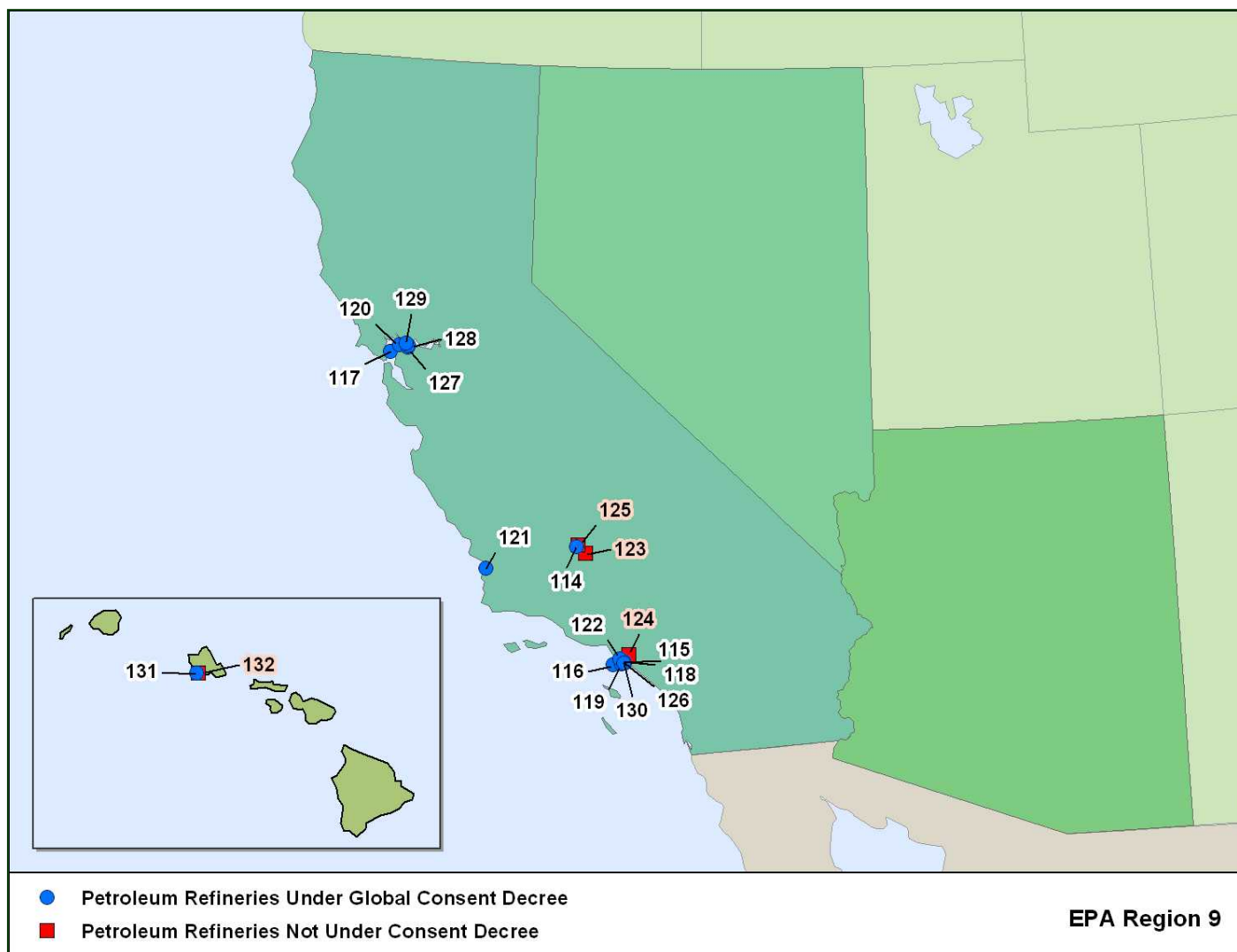
- 104. Big West Oil LLC – Salt Lake City – 25,000
- 107. Holly Corporation – Woods Cross – 25,000
- 108. Silver Eagle Refining Inc. – Woods Cross – 12,500

Wyoming

- 110. Frontier Refining Inc. – Cheyenne – 46,000
- 111. Sinclair Oil Corp. – Sinclair – 22,000
- 112. Sinclair/Little America – Casper – 22,500
- 113. Wyoming Refining Co. – Newcastle – 12,500

By state: Number on map, Company, Refinery,
Crude oil capacity (barrels/day)
Data from Oil & Gas Journal's 2005 Worldwide
Refining Survey, December 19, 2005

Region 9 Petroleum Refineries



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Region 9 Petroleum Refineries

Refineries under CD

California

- 114. Big West Oil LLC – Bakersfield – 65,000
- 115. BP PLC – Carson – 247,000
- 116. Chevron Corp. – El Segundo – 260,000
- 117. Chevron Corp. – Richmond – 225,000
- 118, 119. ConocoPhillips – LAR-Carson and Wilmington – 138,700
- 120, 121. ConocoPhillips – SF-Rodeo and Santa Maria – 120,000
- 122. ExxonMobil Refining and Supply Co. – Torrance – 149,500
- 126. Shell Oil Products US – Los Angeles 100,000
- 127. Shell Oil Products US – Martinez – 157,600
- 128. Tesoro Corp. – Golden Eagle – 161,000
- 129. Valero Energy Corp. – Benicia – 139,500
- 130. Valero Energy Corp. – Wilmington – 80,000

Hawaii

- 131. Chevron Corp. – Hawaii – 54,000

Refineries not under CD

California

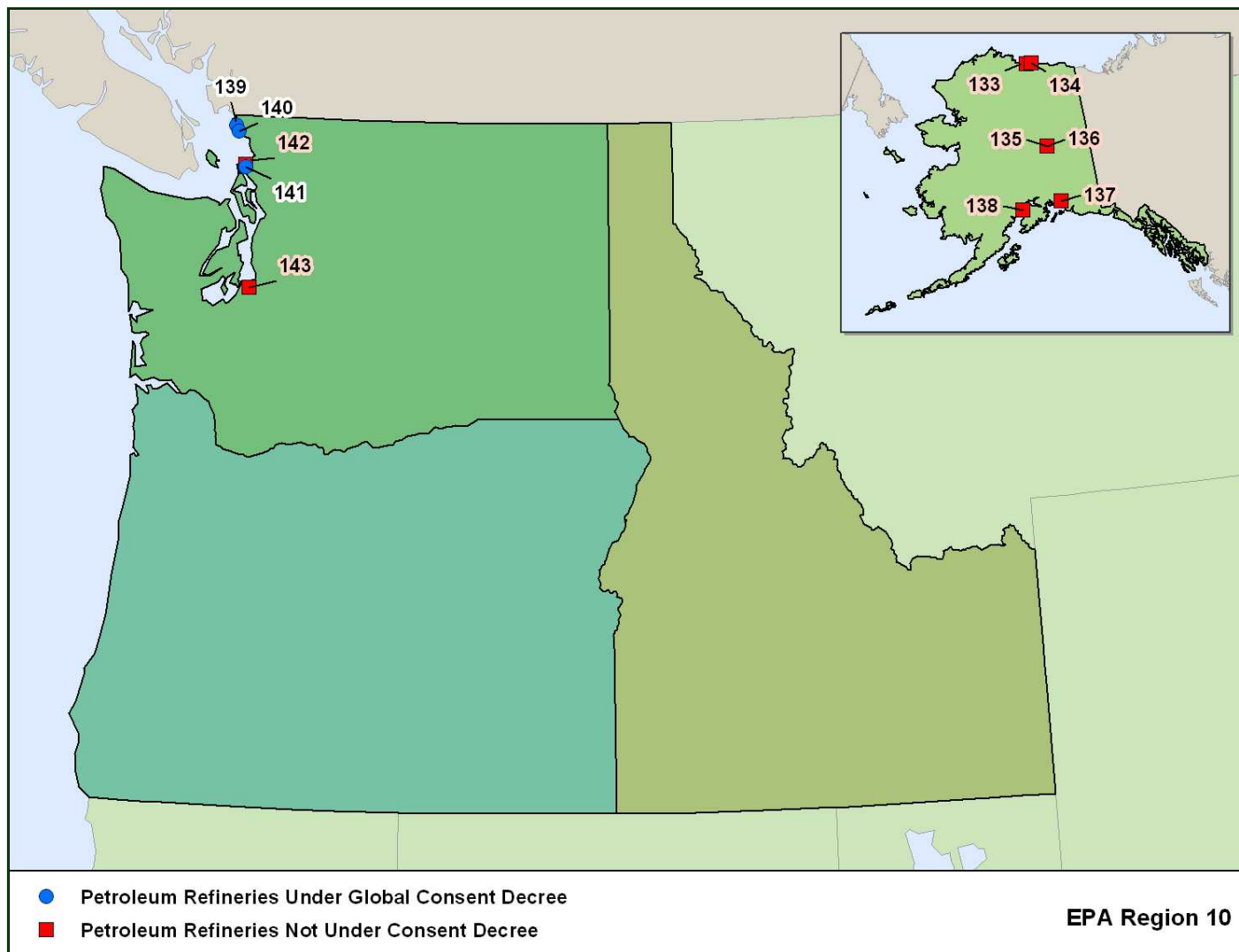
- 123. Kern Oil and Refining Co. – Bakersfield – 25,000
- 124. Paramount Petroleum Corp. – Long Beach – 52,000
- 125. San Joaquin Refining Co., Inc. – Bakersfield – 24,300

Hawaii

- 132. Tesoro Hawaii Corp. – Hawaii – 93,700

By state: Number on map, Company, Refinery,
Crude oil capacity (barrels/day)
Data from Oil & Gas Journal's 2005 Worldwide
Refining Survey, December 19, 2005

Region 10 Petroleum Refineries



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Region 10 Petroleum Refineries

Refineries under CD

Washington

- 139. BP PLC – Cherry Point – 220,400
- 140. ConocoPhillips – Ferndale – 96,000
- 141. Shell Oil Products US – Puget Sound – 306,000

By state: Number on map, Company, Refinery,
Crude oil capacity (barrels/day)
Data from Oil & Gas Journal's 2005 Worldwide
Refining Survey, December 19, 2005

Refineries not under CD

Alaska

- 133. BP PLC – Kuparuk – 14,500
- 134. BP PLC – Prudhoe Bay – 15,000
- 135. Flint Hills Resources – North Pole – 215,175
- 136. Petro Star Inc. – North Pole – 17,500
- 137. Petro Star Inc. – Valdez – 48,000
- 138. Tesoro Alaska Company – Kenai – 72,000

Washington

- 142. Tesoro West Coast Co. – Anacortes – 113,300
- 143. US Oil and Refining Co. – Tacoma – 35,800



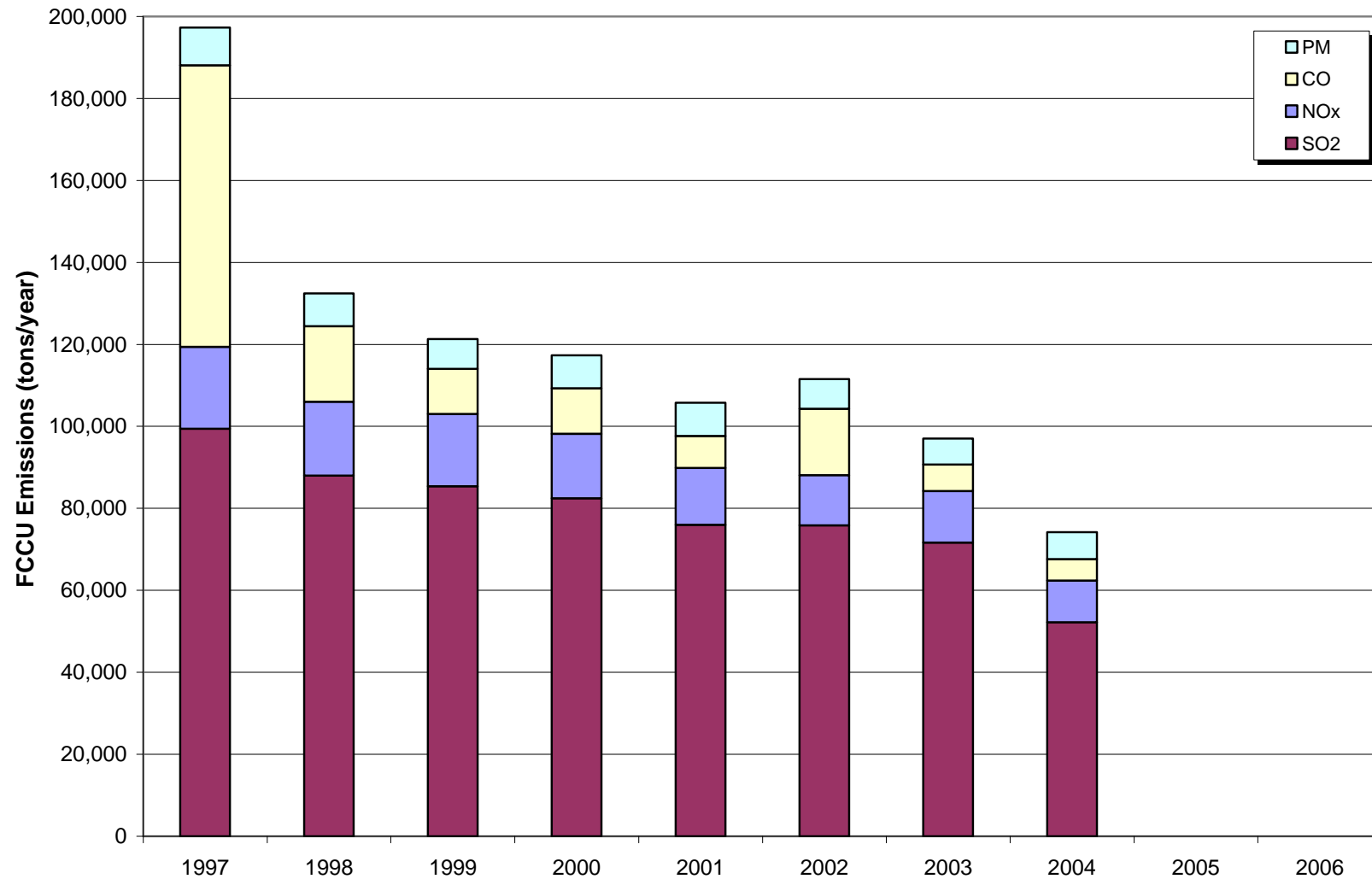
Petroleum Refinery Initiative

Actual Emissions Reductions from Settling Refiners under Consent Decrees

(Entered as of June 1, 2005)



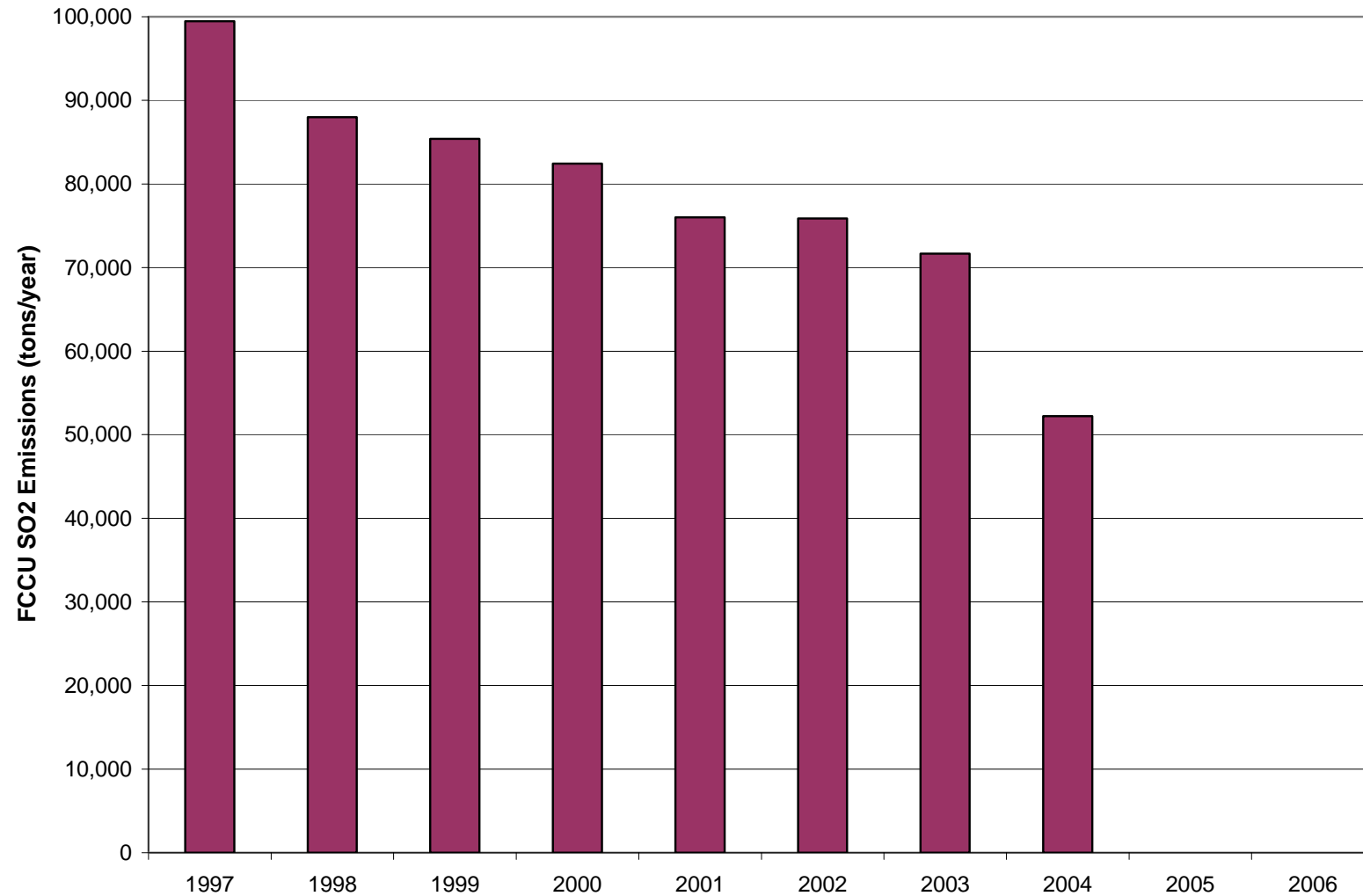
Actual FCCU Emissions from Refineries under Consent Decrees
(Koch, BP, Motiva-Equilon-Deer Park, MAP, Conoco, Montana, Lion, Coastal, CHS)



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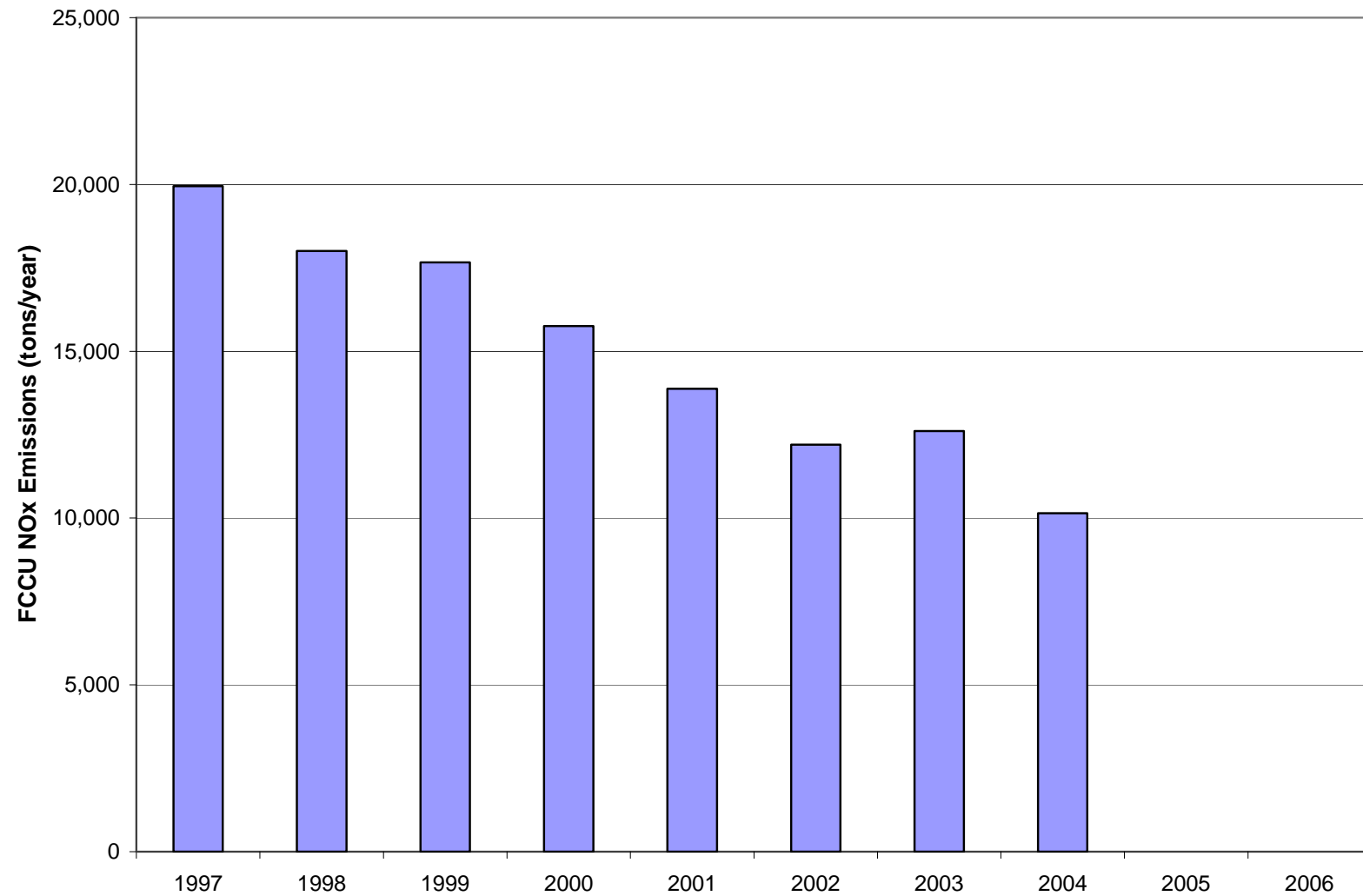
**Actual FCCU SO₂ Emissions from Refineries under Consent Decrees
(Koch, BP, Motiva-Equilon-Deer Park, MAP, Conoco, Montana, Lion, Coastal, CHS)**



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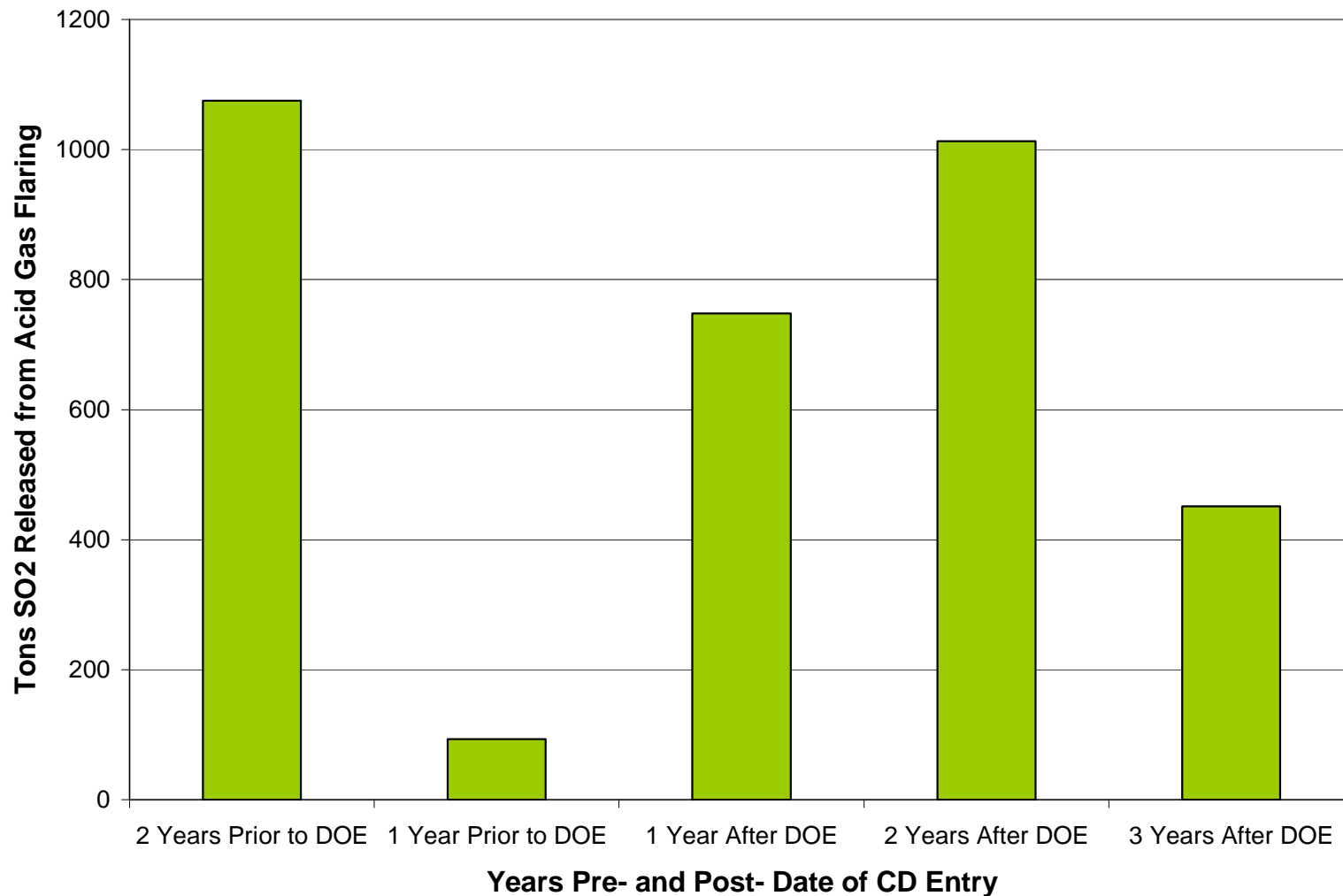
Actual FCCU NOx Emissions from Refineries under Consent Decrees
(Koch, BP, Motiva-Equilon-Deer Park, MAP, Conoco, Montana, Lion, Coastal, CHS)



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Reductions in SO₂ from Flaring

(Koch, BP, Motiva-Equilon-Deer Park, MAP, and Conoco Consent Decrees)



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Petroleum Refinery Initiative

Schedule for Installation of Controls:

All Refiners

(Decrees entered as of June 1, 2005)

Fluidized Catalytic Cracking Unit (FCCU) Emissions Reduction Compliance Dates

		2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015
Flint Hills	DOL Dec 2000															
	FCCU SO ₂		2 ■	■												
	FCCU NO _x		▲			▲			▲	▲						
BP	DOL Jan 2001															
	FCCU SO ₂	■			■ ■	3 ■ ¹	4 ■									
	FCCU NO _x					3 ▲ ²	▲ 2 ▲	▲								
M-E-DP	DOL Mar 2001															
	FCCU SO ₂	2 ■		■	■ ▲	■	■	2 ■	■							
	FCCU NO _x				▲	2 ▲	▲ ▲ ▲	2 ▲								
MAP	DOL May 2001															
	FCCU SO ₂	2 ■			■ ■	■ ■	2 ■									
	FCCU NO _x				▲		4 ▲ ▲	▲	▲				▲			
Conoco	DOL Dec 2001															
	FCCU SO ₂					■ ■ ■	2 ■ ⁴									
	FCCU NO _x					2 ▲ ³	▲ ⁵ ▲ ▲	▲	▲							

Notes:

SO₂: ■=interim hard limit, ■= final hard limits, ■= hardware installation, ■= hardware limits effective, □= start of additives, ■= additives demonstration report deadline, Slashes (/) indicate combinations (e.g. either additives or hard limits).

NO_x: ▲= interim hard limit, ▲= hard limits, ▲= hardware installation, ▲= hardware limits effective, ▲= start of additives and/or low NOx COPs, ▲= additives demonstration report deadline, Slashes (/) indicate combinations (e.g. either additives or hard limits).

Footnotes:

¹BP Carson, Texas City FCCU 1, Texas City FCCU 2: Compliance date for SO₂ final limits is date of entry of Fourth Amendment to the Consent Decree, October 7, 2005.

²BP Carson, Texas City FCCU 1, Whiting FCU 600: Compliance date for NO_x final limits is date of entry of Fourth Amendment to the Consent Decree, October 7, 2005.

³Ponca City 5: NO_x reducing additive demonstration report provides interim NO_x limits until the hardware limits are effective.

⁴Suncor Denver: SO₂ reducing additive demonstration report deadline based on SO₂ demonstration beginning 9/2005.

⁵Suncor Denver: NO_x reducing additive demonstration report deadline based on NO_x demonstration beginning 6/2005.

FCCU Emissions Reduction Compliance Dates

		2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015
Montana	DOL Dec 2001															
	FCCU SO ₂					■										
	FCCU NO _x					▲										
Navajo	DOL Dec 2001															
	FCCU SO ₂			■												
	FCCU NO _x						▲									
Lion Oil	DOL Mar 2003															
	FCCU SO ₂				■											
	FCCU NO _x									▲						
Chevron	DOL Oct 2003															
	FCCU SO ₂			□		■		■	■	■		■				
	FCCU NO _x			▲				▲	▲		▲	▲				
Sunoco (Coastal)	DOL Oct 2003															
	FCCU SO ₂			■												
	FCCU NO _x			▲			▲									
CHS	DOL Oct 2003															
	FCCU SO ₂						■									
	FCCU NO _x						▲									

Notes:

SO₂: □=interim hard limit, ■= final hard limits, ■= hardware installation, ■= hardware limits effective, □= start of additives, ■= additives demonstration report deadline, Slashes (/) indicate combinations (e.g. either additives or hard limits).

NO_x: ▲= interim hard limit, ▲= hard limits, ▲= hardware installation, ▲= hardware limits effective, ▲= start of additives and/or low NO_x COPs, ▲= additives demonstration report deadline, Slashes (/) indicate combinations (e.g. either additives or hard limits).

Footnotes:

¹Chevron Salt Lake City: If WGS is installed, compliance date is 3/2012; if WGS is not installed, compliance date is 9/2010.

²CHS Laurel: If WGS is installed, compliance date is 12/2009; if WGS is not installed, compliance date is 12/2007.

FCCU Emissions Reduction Compliance Dates

		2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015
CITGO	DOL Oct 2004															
	FCCU SO ₂							2 ■			■		■	■		
	FCCU NO _x					△		▲			2 ▲		▲	▲	▲	
Conoco-Phillips	DOL Jan 2005															
	FCCU SO ₂					2 ■	2 ■	2 ■	■	■	■	■	■	■		■
	FCCU NO _x									3 ▲	▲	▲	▲	2 ▲	▲	▲
Sunoco	DOL Jun 2005															
	FCCU SO ₂								■	■				■		
	FCCU NO _x							▲		▲				▲		
Valero	DOL Jun 2005															
	FCCU SO ₂					■ ■ ■	2 ■ ² ■ ■	■ ■			■	4 ■ ³	■	■		
	FCCU NO _x						2 ▲	▲ 2 ▲								
ExxonMobil &Chalmette	DOL Oct 2005															
	FCCU SO ₂					■	3 ■ ⁴ ■		■	■			■			
	FCCU NO _x					▲	2 ▲ ⁵ ▲	▲ ▲	▲ ⁶	▲	2 ▲		▲			

Notes:

SO₂: □=interim hard limit, ■= final hard limits, ■= hardware installation, ■= hardware limits effective, □= start of additives, ■= additives demonstration report deadline, Slashes (/) indicate combinations (e.g. either additives or hard limits).

NO_x: △= interim hard limit, ▲= hard limits, ▲= hardware installation, ▲= hardware limits effective, △= start of additives and/or low NO_x COPs, ▲= additives demonstration report deadline, Slashes (/) indicate combinations (e.g. either additives or hard limits).

Footnotes:

¹ConocoPhillips Alliance: If SNERT is installed, compliance date is 3/2015; if SNERT is not installed, compliance date is 12/2009.

²Valero Paulsboro, Texas City: Compliance dates for WGS and SO₂ final limits are based on Date of Entry; timeline assumes Consent Decree will be entered by the end of the second quarter 2006.

³Valero Corpus Christi East, Denver, Wilmington: One refinery must install WGS to meet hard limits in 2010 while the other refineries must use SO₂ reducing additives. A non-selected refinery can take hard limits in lieu of using additives.

⁴ExxonMobil Torrance, Beaumont, Baytown FCCU 3: Compliance dates for SO₂ final limits are based on Date of Entry; timeline assumes Consent Decree will be entered by the end of 2006.

⁵ExxonMobil Torrance, Baton Rouge: Compliance dates for NO_x final limits are based on Date of Entry; timeline assumes Consent Decree will be entered by the end of 2006.

⁶Chalmette: If additives are found to be effective, compliance date is 6/30/2007, if additives are not effective, compliance date is 12/31/2008.



Petroleum Refinery Initiative

Information and Emissions Data by
Individual Refiner/Refinery



Flint Hills (formerly Koch)

December 2000

- 3 refineries in Texas and Minnesota
- \$80 million in injunctive relief
- Annual Reductions
 - 5,200 tons of NO_x and SO₂
- Penalty: \$1 million
- SEPs: \$3.5 million
- Co-Plaintiff: Minnesota
- The refining business of Koch Petroleum Group was restructured into Flint Hills Resources in 2002

Koch FCCU Emissions Reduction Compliance Dates

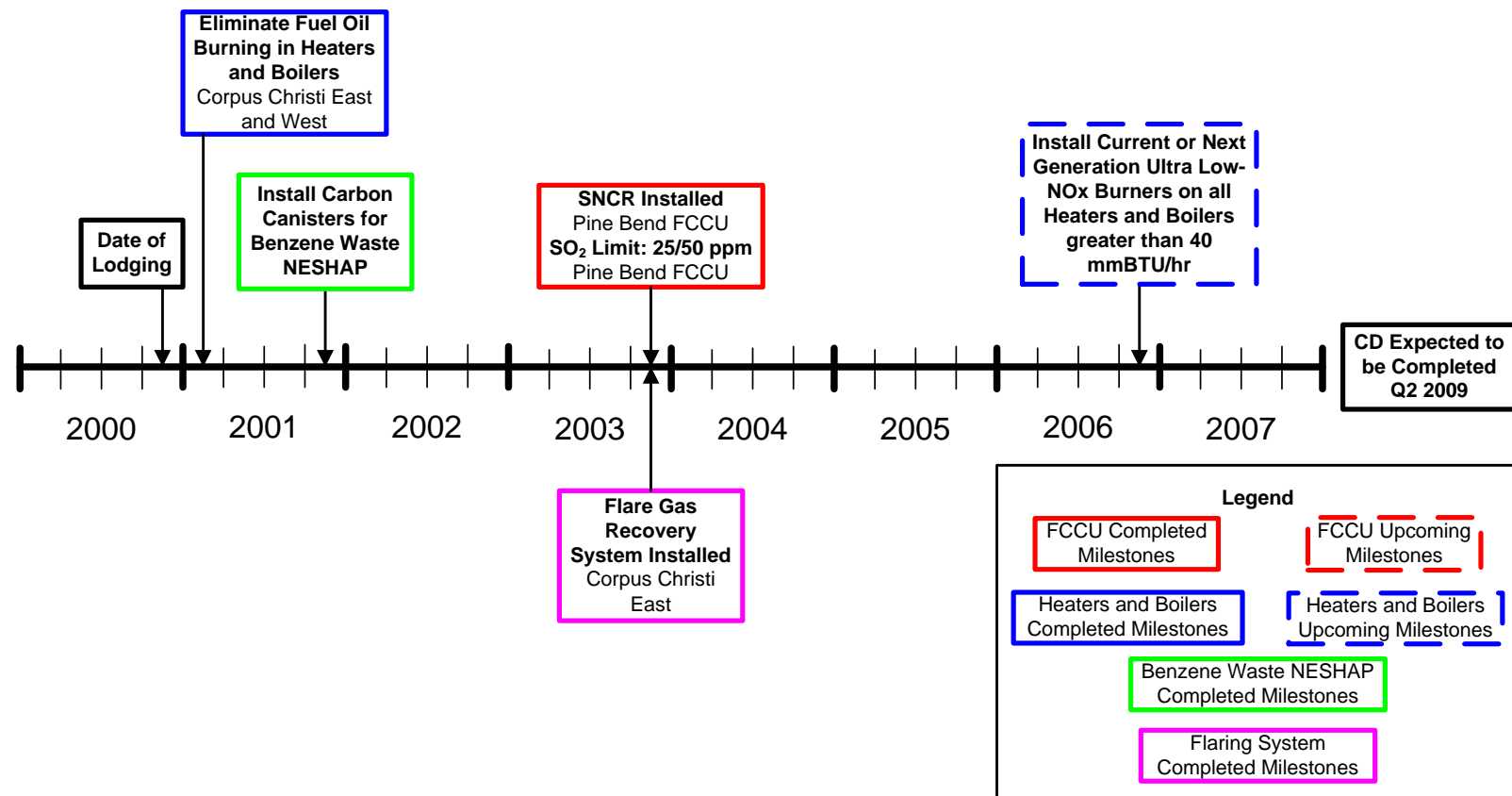
DOL Dec 2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015
Flint Hills Corpus Christi East															
FCCU SO ₂															
FCCU NO _x					Δ	▲		Δ	▲						
Flint Hills Corpus Christi West															
FCCU SO ₂															
FCCU NO _x	Δ	▲			Δ	▲	Δ	▲							
Flint Hills Pine Bend															
FCCU SO ₂															
FCCU NO _x				Δ	▲										

Notes:
SO₂: □=interim hard limit, ■= final hard limits, □= hardware installation, ■= hardware limits effective, □= start of additives, ■= additives demonstration report deadline, Slashes (/) indicate combinations (e.g. either additives or hard limits).
NO_x: Δ= interim hard limit, ▲= hard limits, Δ= hardware installation, ▲= hardware limits effective, Δ= start of additives and/or low NOx COPs, ▲= additives demonstration report deadline, Slashes (/) indicate combinations (e.g. either additives or hard limits).

Footnotes:

Hardware is not required if the use of NOx reducing additives lower emissions to meet a specific limit.

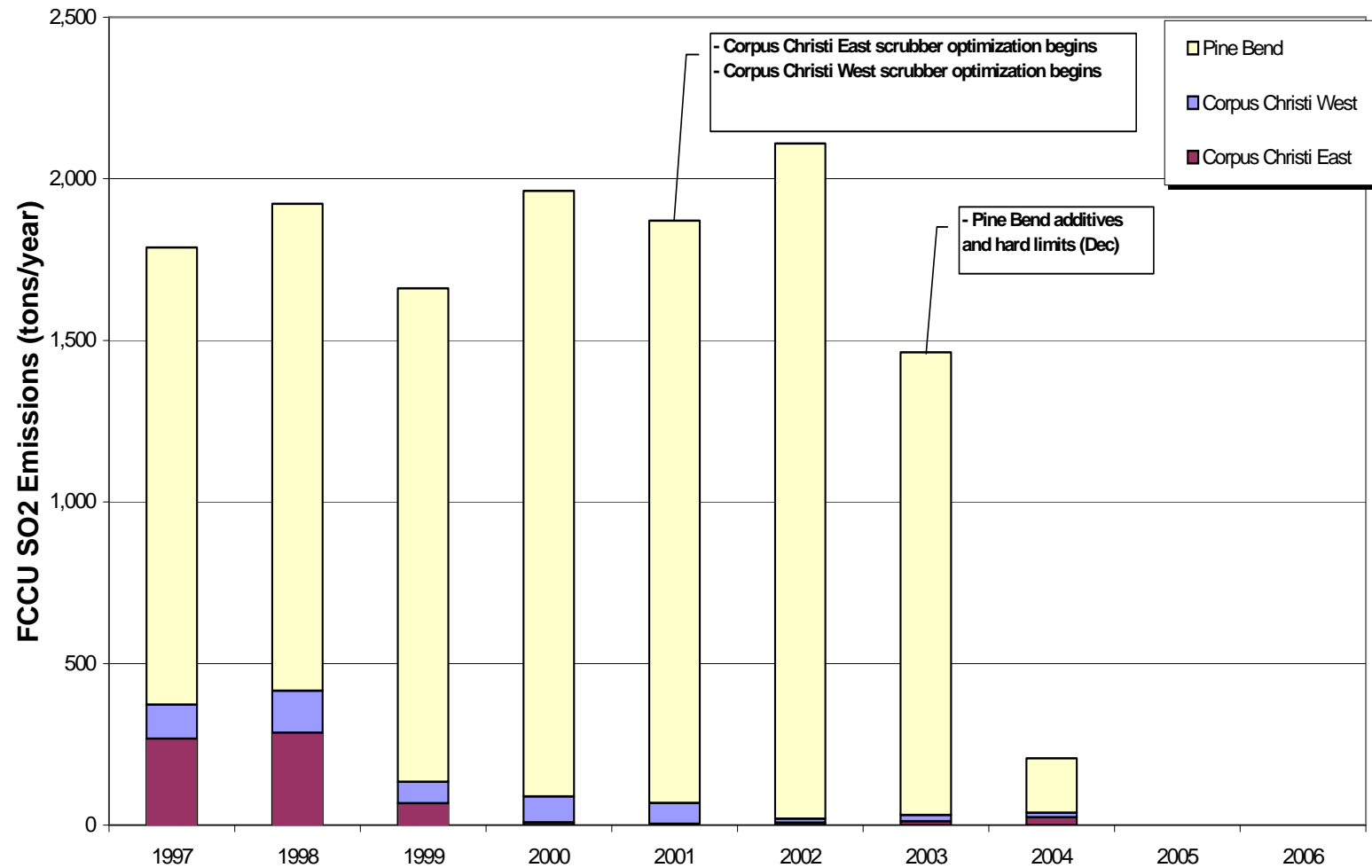
Koch Emissions Controls Milestones





Koch Actual FCCU SO₂ Emissions

Date of Lodging: 12/22/2000

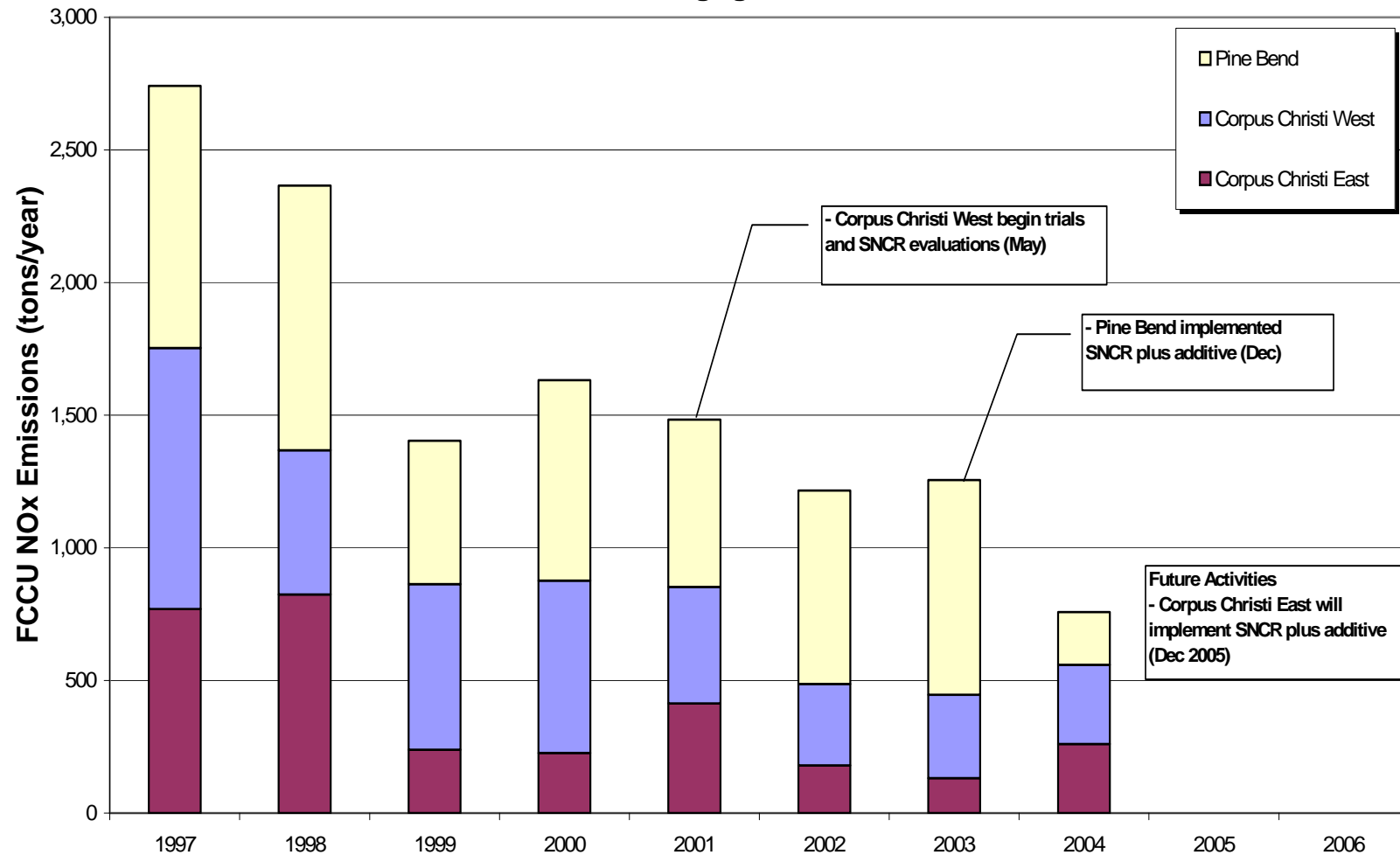


Updated 03/21/06 - Subject to Revision



Koch Actual FCCU NOx Emissions

Date of Lodging: 12/22/2000





BP

January 2001

- 8 refineries in California, Indiana, North Dakota, Texas, Utah, Virginia, Washington and Ohio
- \$600 million in injunctive relief
- Annual Reductions
 - 22,000 tons of NO_x
 - 27,300 tons of SO₂
- Penalty: \$10 million
- Co-Plaintiffs: Indiana, Ohio and Northwest Air Pollution Authority
- Tesoro Petroleum Corporation acquired the Mandan, North Dakota and Salt Lake City, Utah refineries in 2001
- Giant Yorktown, Inc. acquired the Yorktown, Virginia refinery in 2002

BP FCCU Emissions Reduction Compliance Dates

DOL Jan 2001	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015
Carson															
FCCU SO ₂						■ ¹									
FCCU NO _x						▲ ²									
Texas City 1															
FCCU SO ₂						■ ¹									
FCCU NO _x						▲ ²									
Texas City 2															
FCCU SO ₂						■ ¹									
FCCU NO _x							▲								
Texas City 3															
FCCU SO ₂							■								
FCCU NO _x								▲							
Toledo															
FCCU SO ₂							■								
FCCU NO _x				△			▲								
Whiting 500															
FCCU SO ₂							■								
FCCU NO _x							▲								
Whiting 600															
FCCU SO ₂							■								
FCCU NO _x							▲ ²								
Tesoro Mandan															
FCCU SO ₂				□	■										
Tesoro Salt Lake City															
FCCU SO ₂	■														
Giant Yorktown															
FCCU SO ₂			□	■											

Notes:

SO₂: □=interim hard limit, ■= final hard limits, □= hardware installation, ■= hardware limits effective, □= start of additives, ■= additives demonstration report deadline, Slashes (/) indicate combinations (e.g. either additives or hard limits).

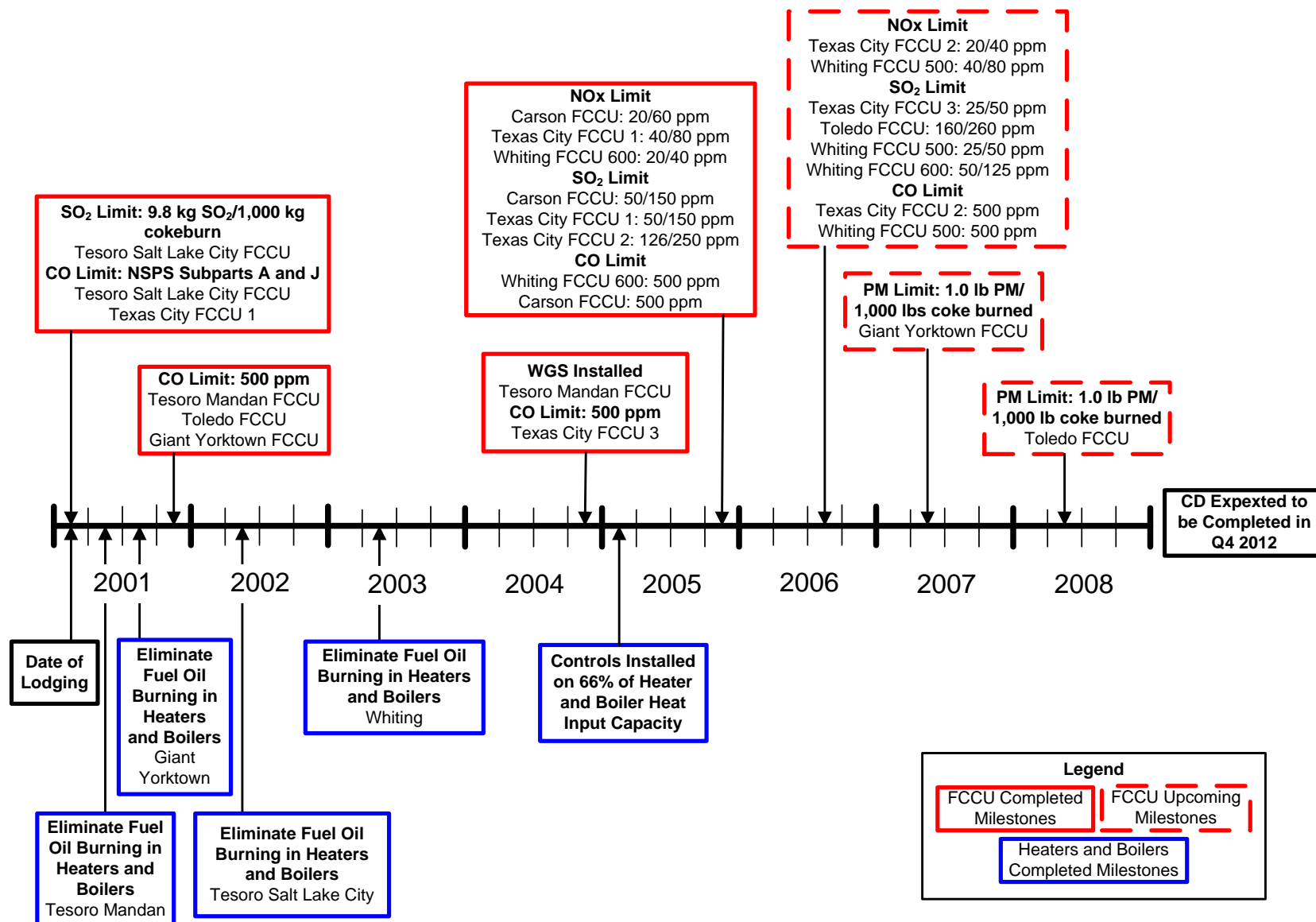
NO_x: ▲= interim hard limit, ▲= hard limits, △= hardware installation, ▲= hardware limits effective, ▲= start of additives and/or low NO_x COPs, ▲= additives demonstration report deadline, Slashes (/) indicate combinations (e.g. either additives or hard limits).

Footnotes:

¹BP Carson, Texas City FCCU 1, Texas City FCCU 2: Compliance date for SO₂ final limits is date of entry of Fourth Amendment to the Consent Decree, October 7, 2005.

²BP Carson, Texas City FCCU 1, Whiting FCCU 600: Compliance date for NO_x final limits is date of entry of Fourth Amendment to the Consent Decree, October 7, 2005.

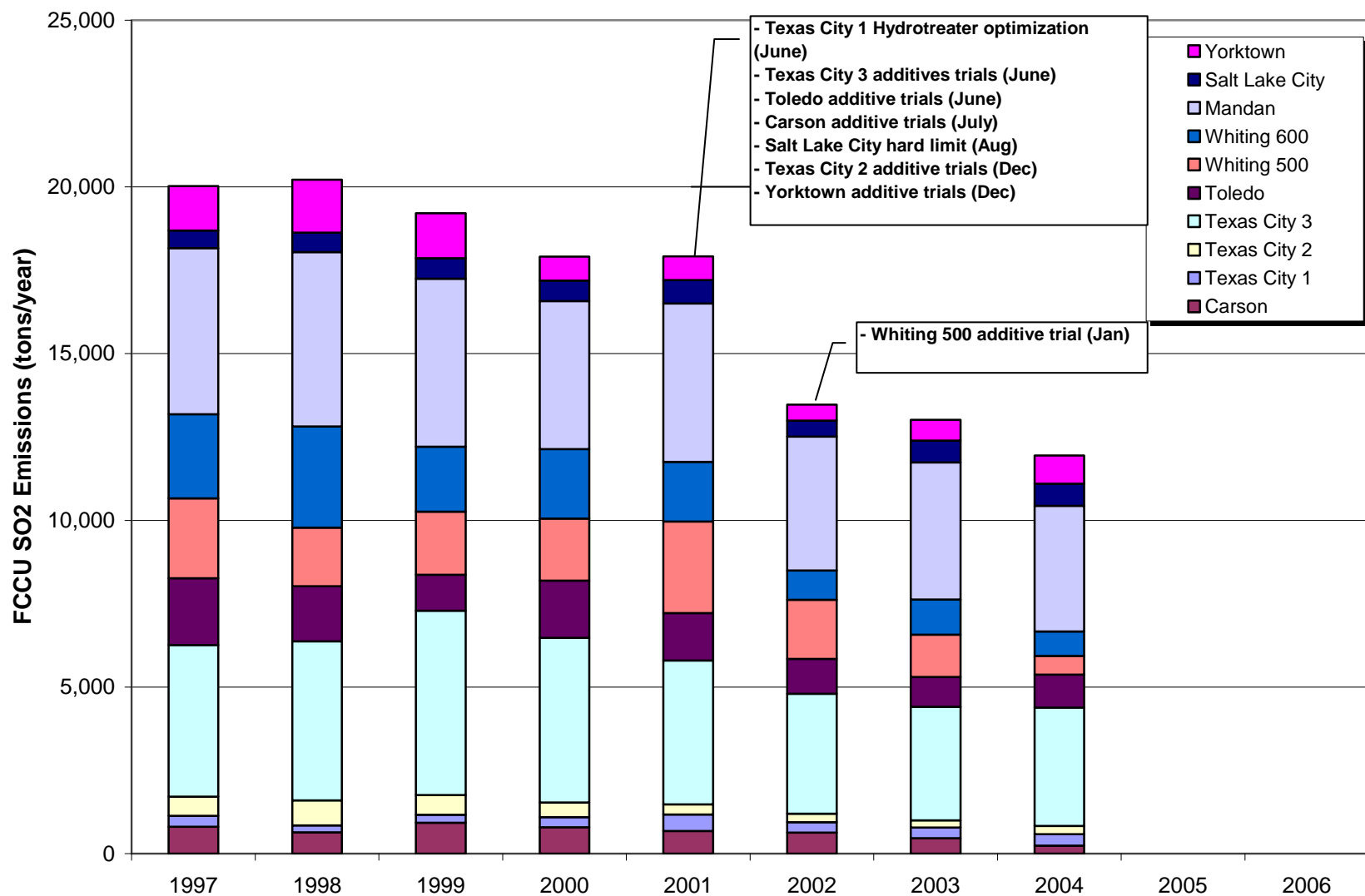
BP Emissions Controls Milestones





BP Actual FCCU SO2 Emissions

Date of Lodging: 1/18/2001

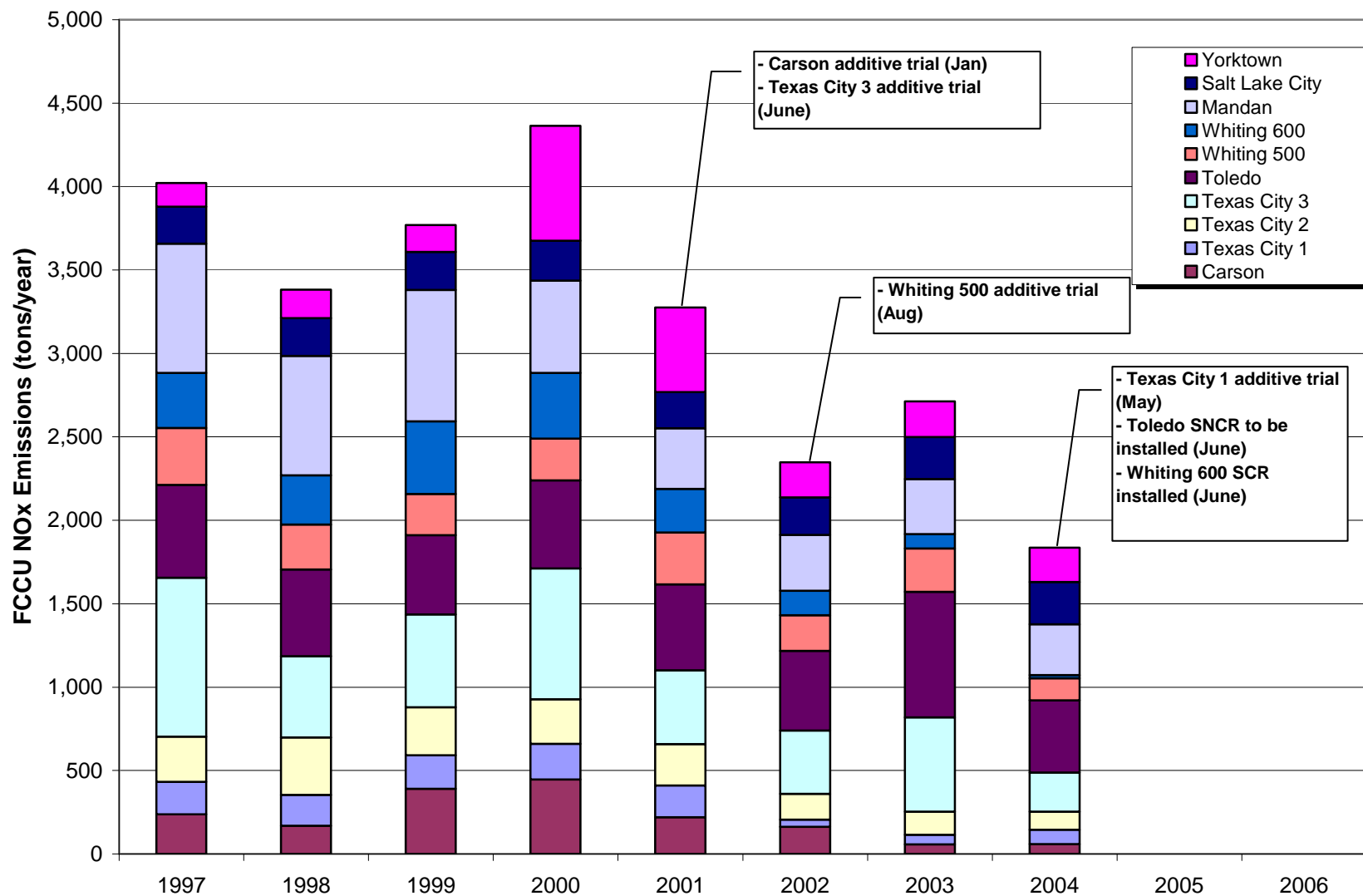


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BP Actual FCCU NOx Emissions

Date of Lodging: 1/18/2001



Updated 03/21/06 - Subject to Revision



Motiva-Equilon-Deer Park

March 2001

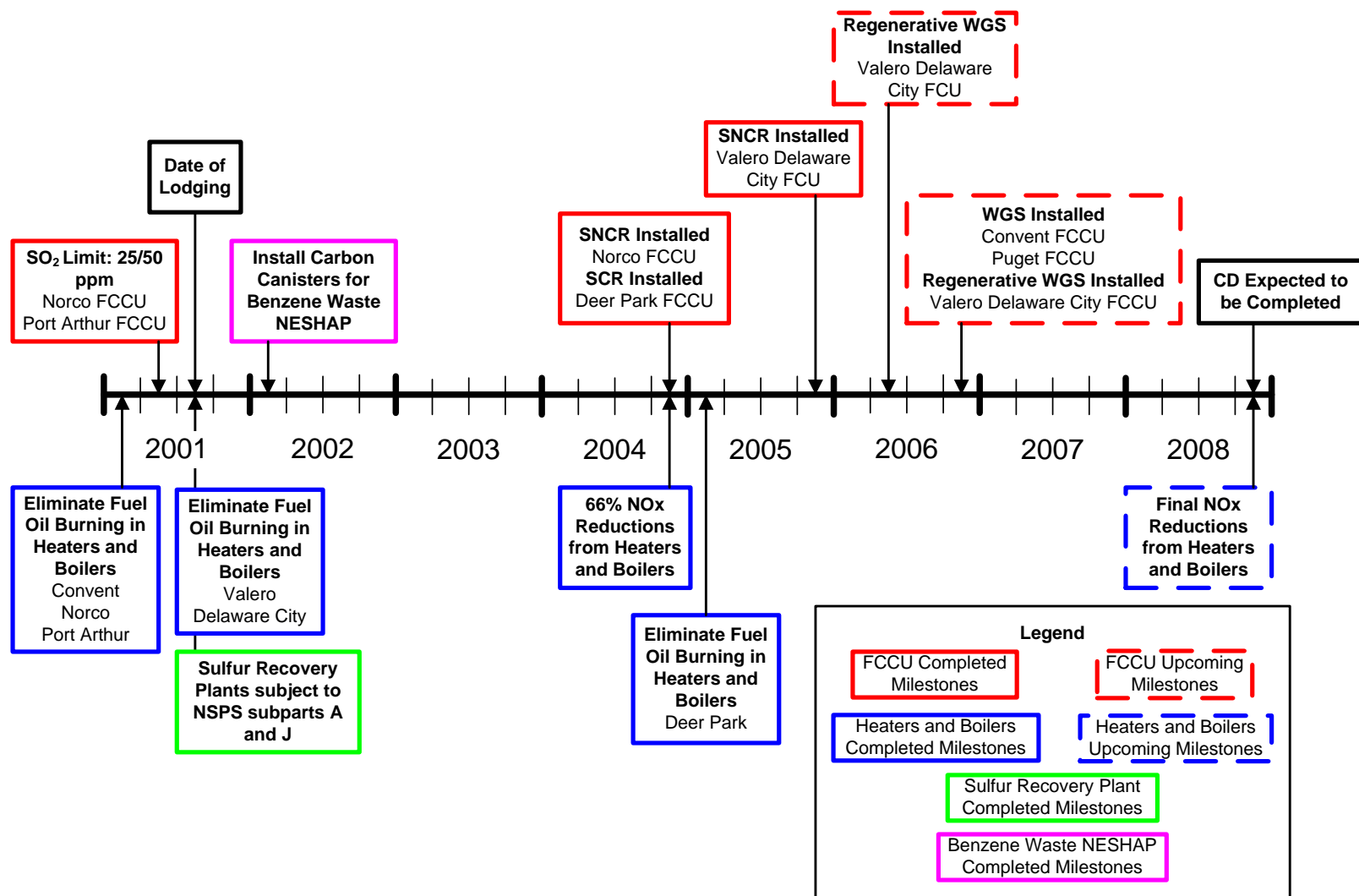
- 9 refineries in California, Washington, Louisiana, Delaware and Texas
- \$400 million in injunctive relief
- Annual Reductions
 - 8,000 tons of NO_x
 - 49,550 tons of SO₂
- Penalty: \$9.5 million
- SEPs: \$5.5 million
- Co-Plaintiffs: Delaware, Louisiana, Northwest Air Pollution Authority and Sierra Club
- Premcor Refining Group, Inc. acquired the Delaware City refinery in 2004
- Valero acquired Premcor and the Delaware City refinery in 2005
- Big West of California, LLC acquired the Bakersfield refinery in 2005

M-E-DP FCCU Emissions Reduction Compliance Dates

DOL Mar 2001	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015
Motiva Convent															
FCCU SO ₂						□■									
FCCU NO _x	Δ					▲									
Motiva Norco															
FCCU SO ₂	■														
FCCU NO _x				Δ	▲										
Motiva Port Arthur															
FCCU SO ₂	■														
FCCU NO _x	Δ					▲									
Shell Deer Park															
FCCU SO ₂			□■												
FCCU NO _x				Δ▲											
Shell Los Angeles															
FCCU SO ₂	□			■											
FCCU NO _x	Δ			▲											
Shell Martinez															
FCCU SO ₂	□				■										
FCCU NO _x	Δ				▲										
Shell Puget Sound															
FCCU SO ₂						□■									
FCCU NO _x				Δ		▲									
Valero Delaware City FCCU															
FCCU SO ₂						□■									
FCCU NO _x				Δ		▲									
Valero Delaware City Coker															
FCCU SO ₂						□■									
FCCU NO _x					Δ	▲									

Notes:
SO₂: □=interim hard limit, ■= final hard limits, □= hardware installation, ■= hardware limits effective, □= start of additives, ■= additives demonstration report deadline, Slashes (/) indicate combinations (e.g. either additives or hard limits).
NO_x: Δ= interim hard limit, ▲= hard limits, Δ= hardware installation, ▲= hardware limits effective, Δ= start of additives and/or low NOx COPs, ▲= additives demonstration report deadline, Slashes (/) indicate combinations (e.g. either additives or hard limits).

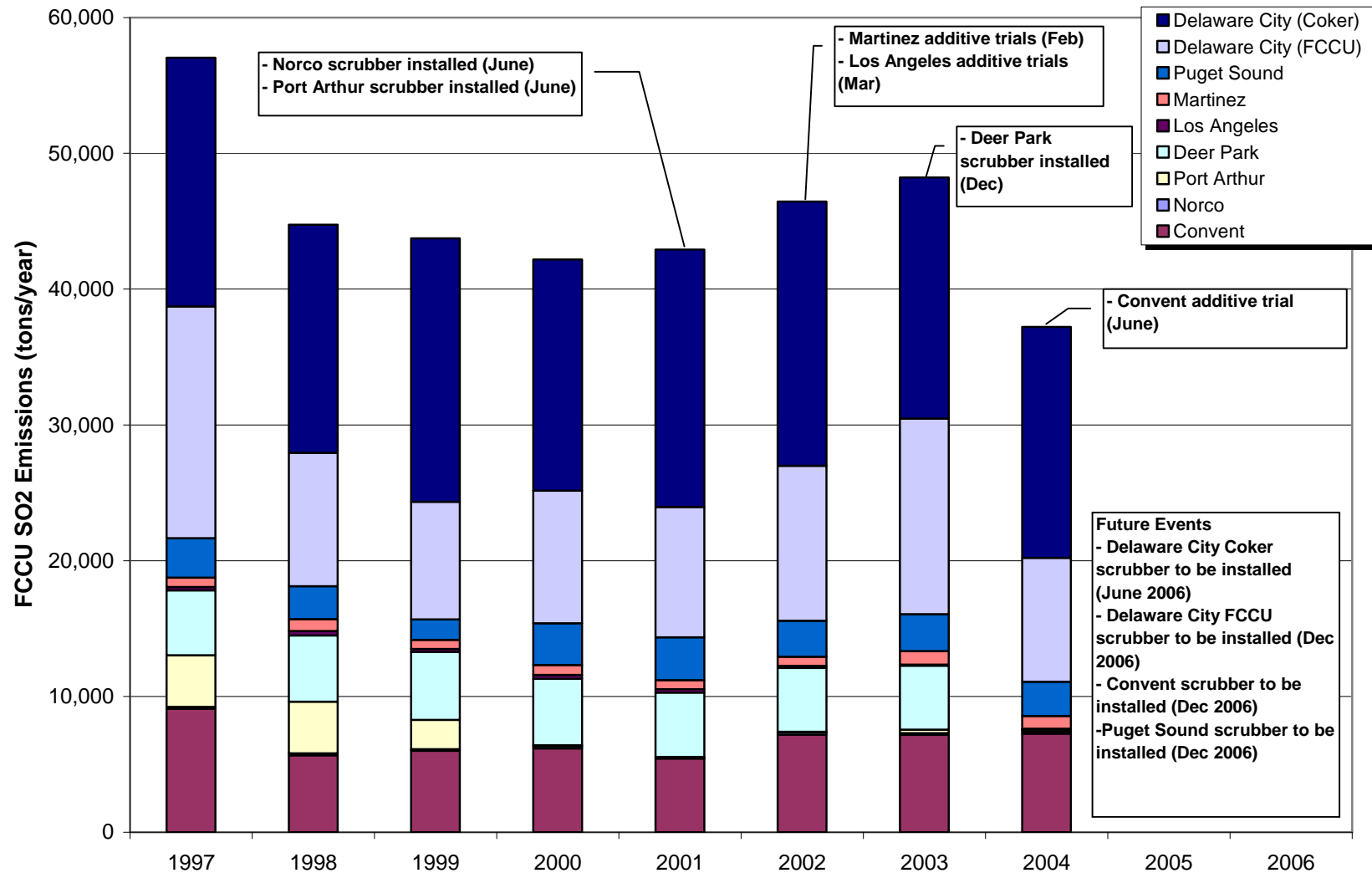
M-E-DP Emissions Controls Milestones





Motiva-Equilon-Deer Park Actual FCCU SO2 Emissions

Date of Lodging: 3/21/2001

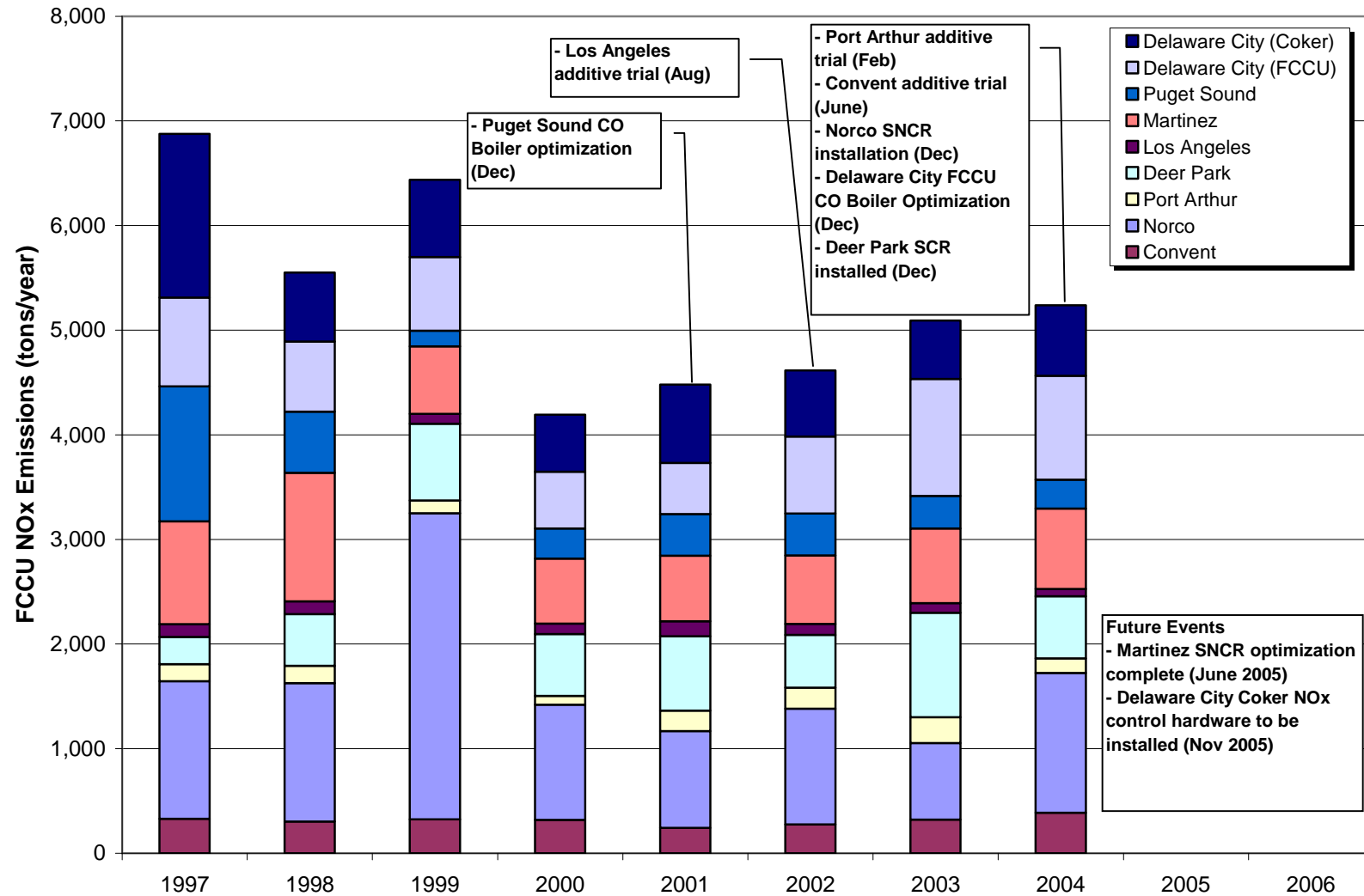


Updated 03/21/06 - Subject to Revision



Motiva-Equilon-Deer Park Actual FCCU NOx Emissions

Date of Lodging: 3/21/2001



Updated 03/21/06 - Subject to Revision



Marathon Ashland Petroleum

May 2001

- 7 refineries in Texas, Louisiana, Kentucky, Illinois, Ohio, Minnesota and Michigan
- \$265 million in injunctive relief
- Annual Reductions
 - 8,000 tons of NO_x
 - 12,800 tons of SO₂
- Penalty: \$3.8 million
- SEPs: \$6.5 million
- Co-Plaintiffs: County of Wayne, Michigan, Louisiana and Minnesota

MAP FCCU Emissions Reduction Compliance Dates

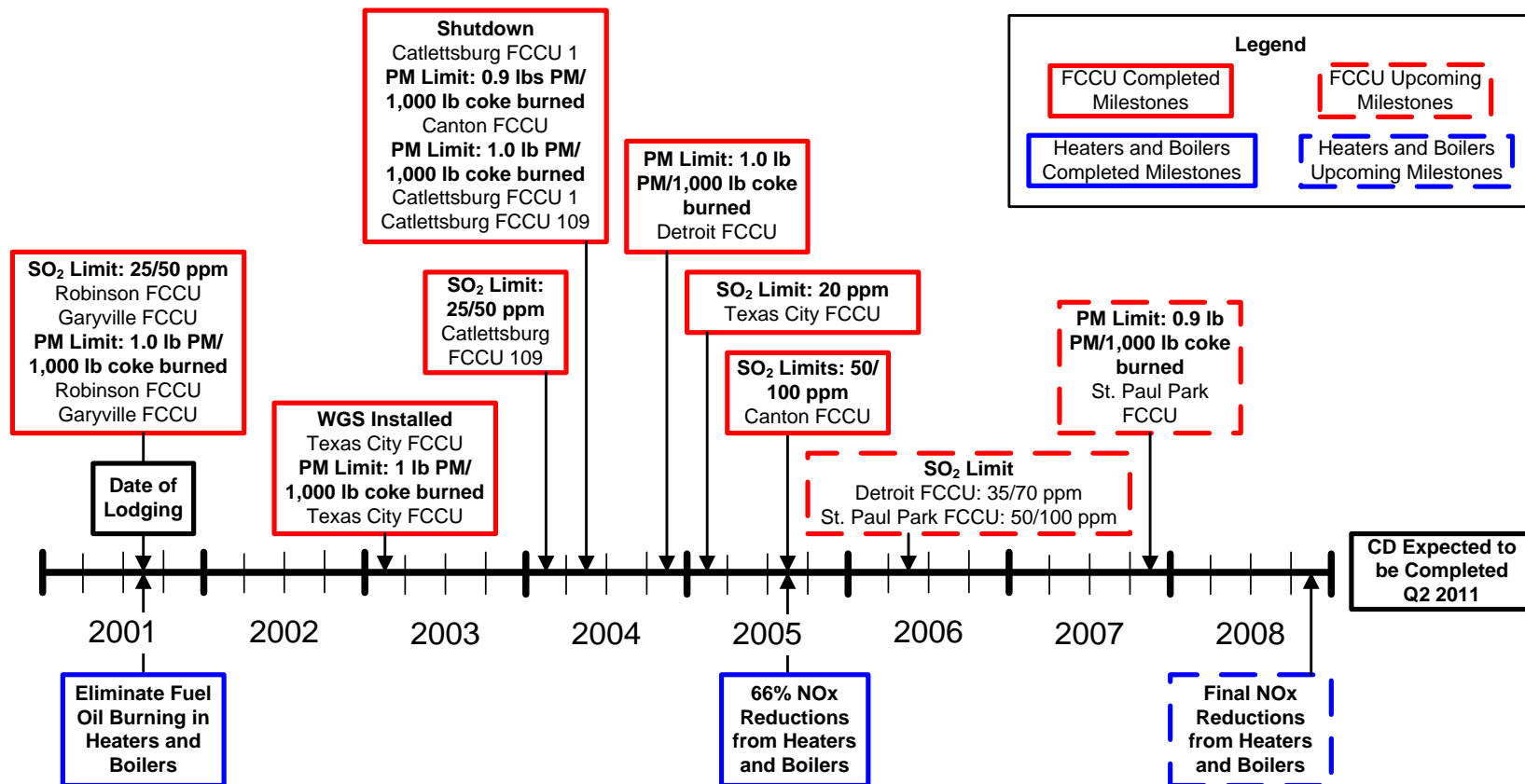
DOL May 2001	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015
Canton															
FCCU SO ₂															
FCCU NO _x															
Catlettsburg FCCU															
FCCU SO ₂															
FCCU NO _x															
Catlettsburg RCCU															
FCCU SO ₂															
FCCU NO _x															
Detroit															
FCCU SO ₂															
FCCU NO _x															
Garyville															
FCCU SO ₂															
FCCU NO _x															
Robinson															
FCCU SO ₂															
FCCU NO _x															
St. Paul Park															
FCCU SO ₂															
FCCU NO _x															
Texas City															
FCCU SO ₂															
FCCU NO _x															

Notes:

SO₂: □=interim hard limit, ■= final hard limits, □= hardware installation, ■= hardware limits effective, □= start of additives, ■= additives demonstration report deadline, Slashes (/) indicate combinations (e.g. either additives or hard limits).

NO_x: △= interim hard limit, ▲= hard limits, ▲= hardware installation, ▲= hardware limits effective, ▲= start of additives and/or low NOx COPs, ▲= additives demonstration report deadline, Slashes (/) indicate combinations (e.g. either additives or hard limits).

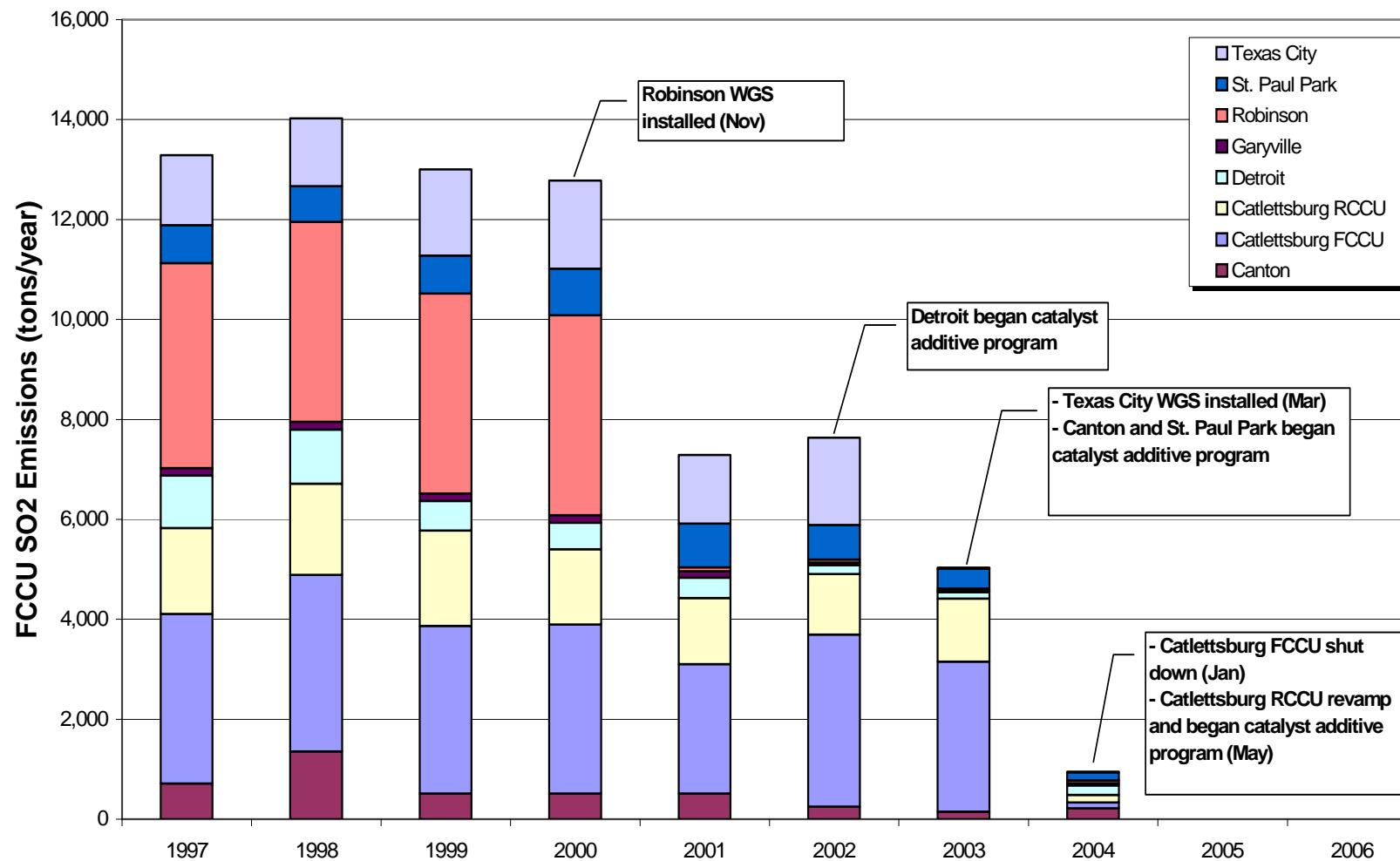
MAP Emissions Controls Milestones





MAP Actual FCCU SO2 Emissions

Date of Lodging: 5/11/2001

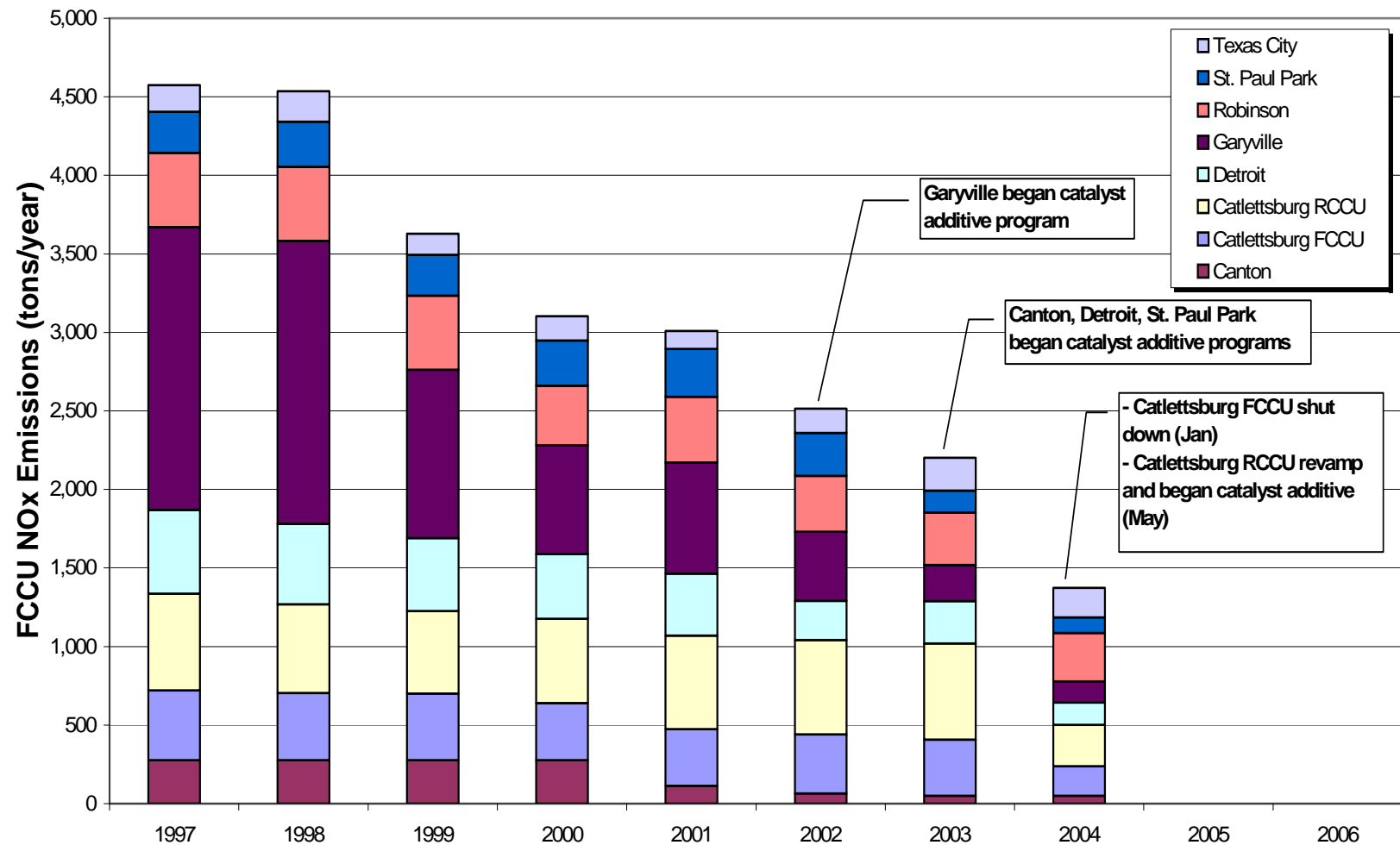


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MAP Actual FCCU NOx Emissions

Date of Lodging: 5/11/2001



Updated 03/21/06 - Subject to Revision



Conoco

(pre-merger with Phillips Petroleum)

December 2001

- 4 refineries in Louisiana, Oklahoma, Montana and Colorado
- \$110 million in injunctive relief
- Annual Reductions
 - 3,210 tons of NOx
 - 4,000 tons of SO2
- Penalty: \$1.5 million
- SEPs: \$5.1 million
- Co-Plaintiffs: Colorado, Louisiana, Oklahoma and Montana
- Suncor Energy (U.S.A.) Inc. acquired the Denver, Colorado refinery in 2003 (later integrated with adjacent refinery acquired from Valero in 2005)

Conoco FCCU Emissions Reduction Compliance Dates

	DOL Dec 2001	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015
Billings	FCCU SO ₂				□	■										
	FCCU NO _x				Δ		▲									
Lake Charles	FCCU SO ₂			□			■									
	FCCU NO _x			Δ			▲									
Ponca City 4	FCCU SO ₂		□			■										
	FCCU NO _x			Δ		▲										
Ponca City 5	FCCU SO ₂		□			■										
	FCCU NO _x			Δ		▲ ¹	▲	▲	▲							
Suncor Denver	FCCU SO ₂			□			■ ²									
	FCCU NO _x			Δ			▲ ³									

Notes:
SO₂: □=interim hard limit, ■= final hard limits, □= hardware installation, ■= hardware limits effective, □= start of additives, ■= additives demonstration report deadline, Slashes (/) indicate combinations (e.g. either additives or hard limits).
NO_x: Δ= interim hard limit, ▲ = hard limits, ▲ = hardware installation, ▲ = hardware limits effective, Δ= start of additives and/or low NOx COPs, ▲ = additives demonstration report deadline, Slashes (/) indicate combinations (e.g. either additives or hard limits).

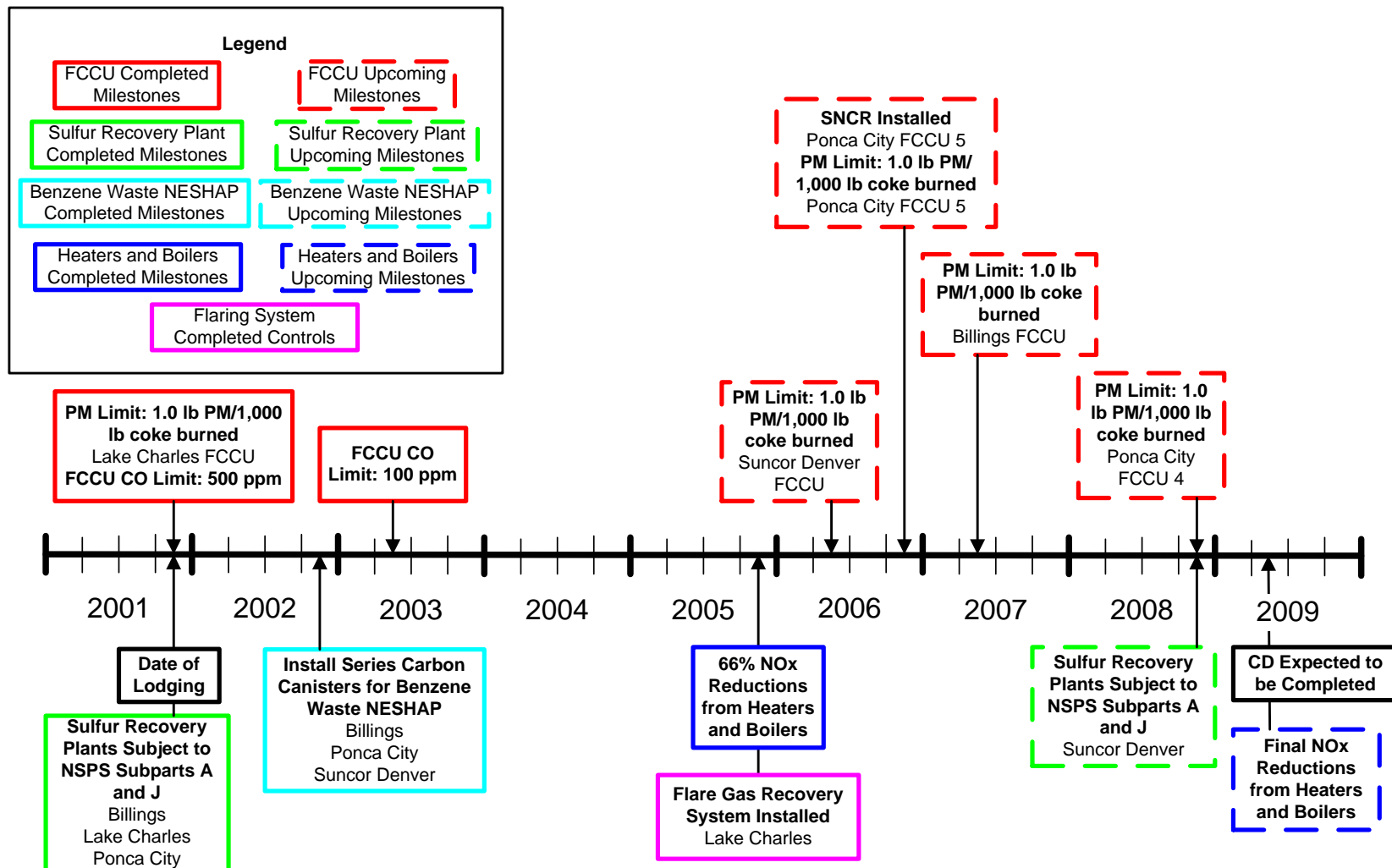
Footnotes:

¹Ponca City 5: NOx reducing additive demonstration report provides interim NOx limits until the hardware limits are effective.

²Suncor Denver: SO2 reducing additive demonstration report deadline based on SO2 demonstration beginning 9/2005.

³Suncor Denver: NOx reducing additive demonstration report deadline based on NOx demonstration beginning 6/2005.

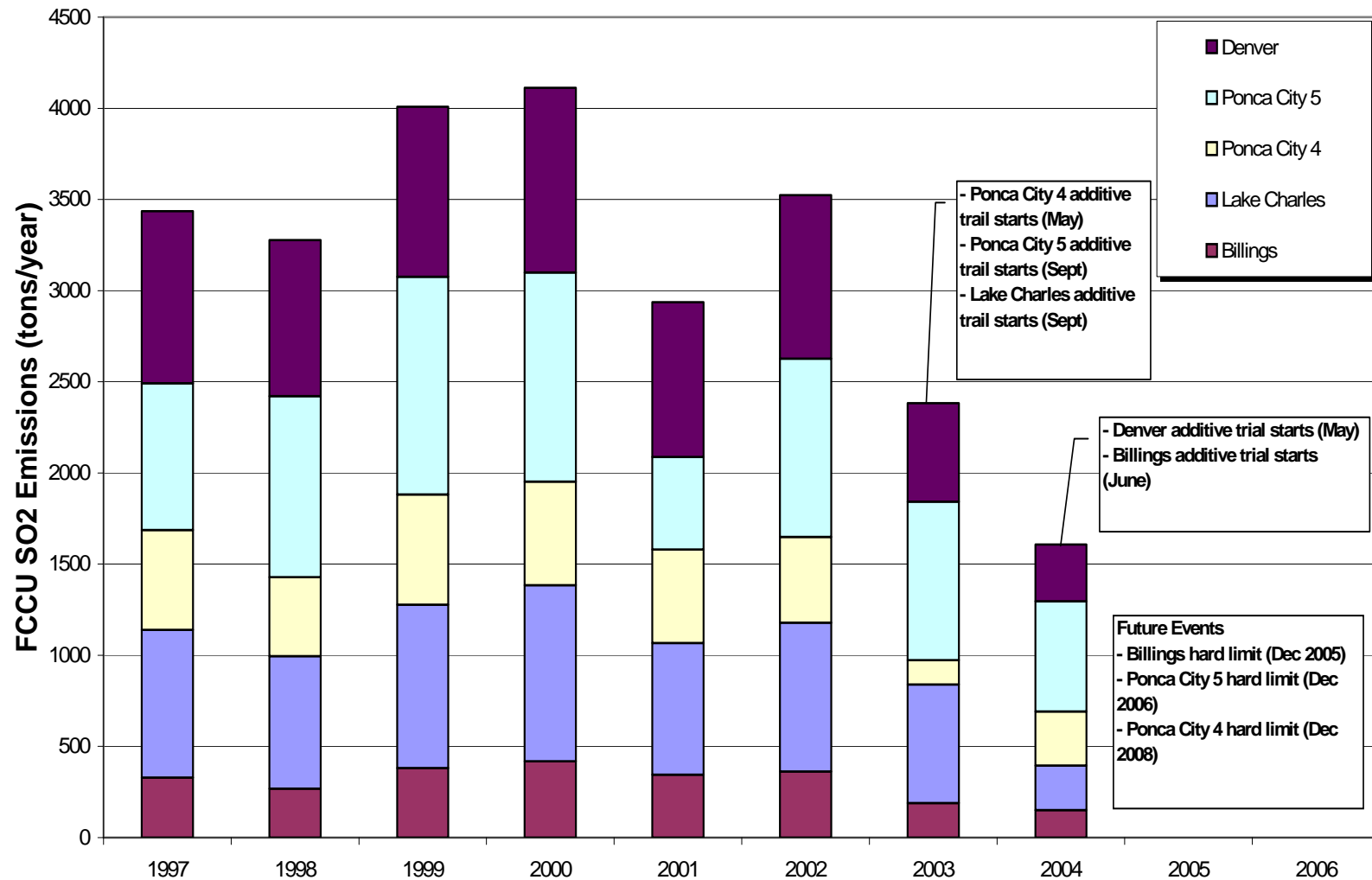
Conoco Emissions Controls Milestones





Conoco and Suncor Actual FCCU SO₂ Emissions

Date of Lodging: 12/20/2001

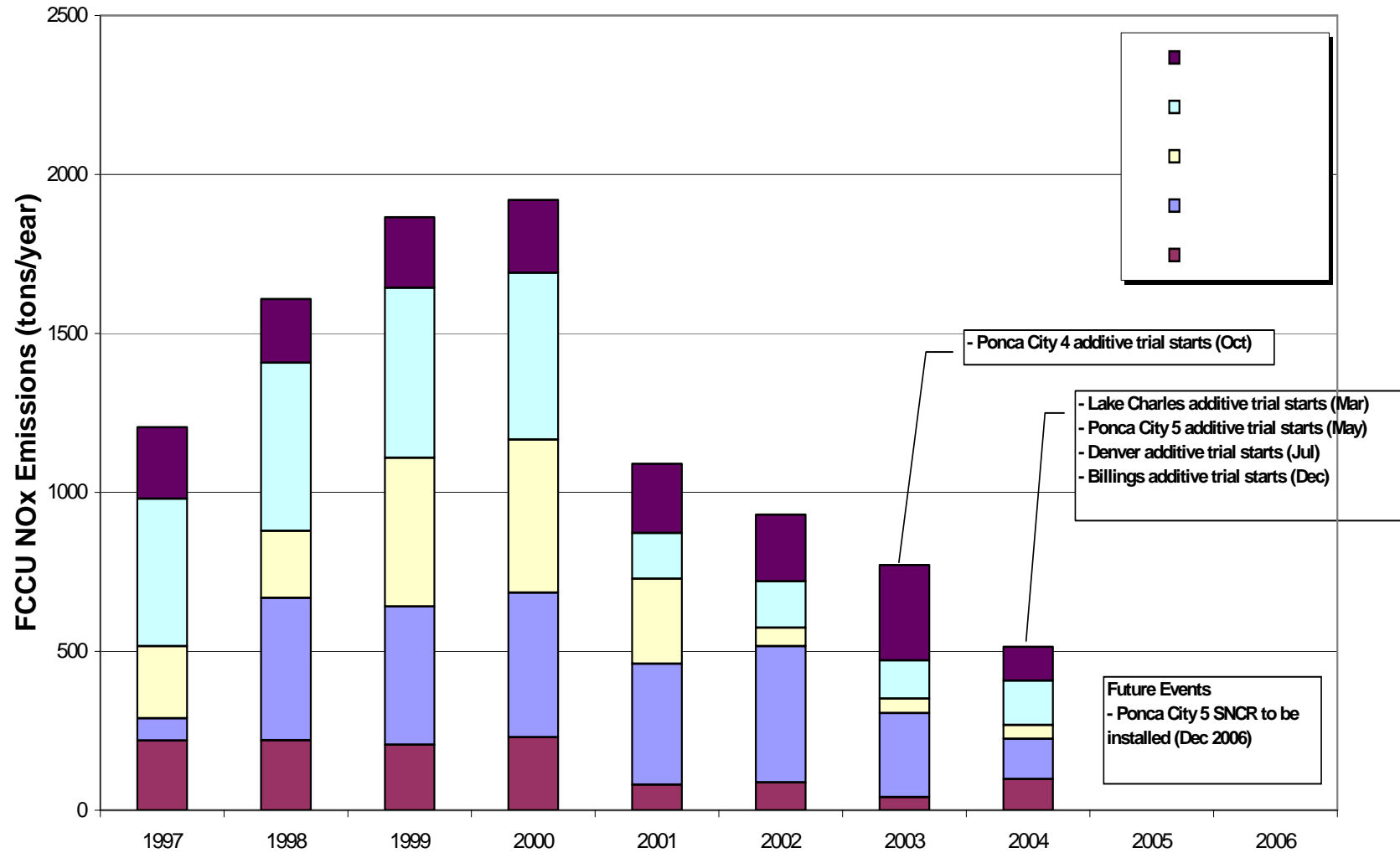


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Conoco and Suncor Actual FCCU NOx Emissions

Date of Lodging: 12/20/2001



Updated 03/21/06 - Subject to Revision



Navajo-Montana

December 2001

- 3 refineries in New Mexico and Montana
- \$15 million in injunctive relief
- Annual Reductions
 - 2,500 tons of NO_x
 - 2,350 tons of SO₂
- Penalty: \$750,000
- SEPs: \$200,000
- Co-Plaintiffs: New Mexico and Montana

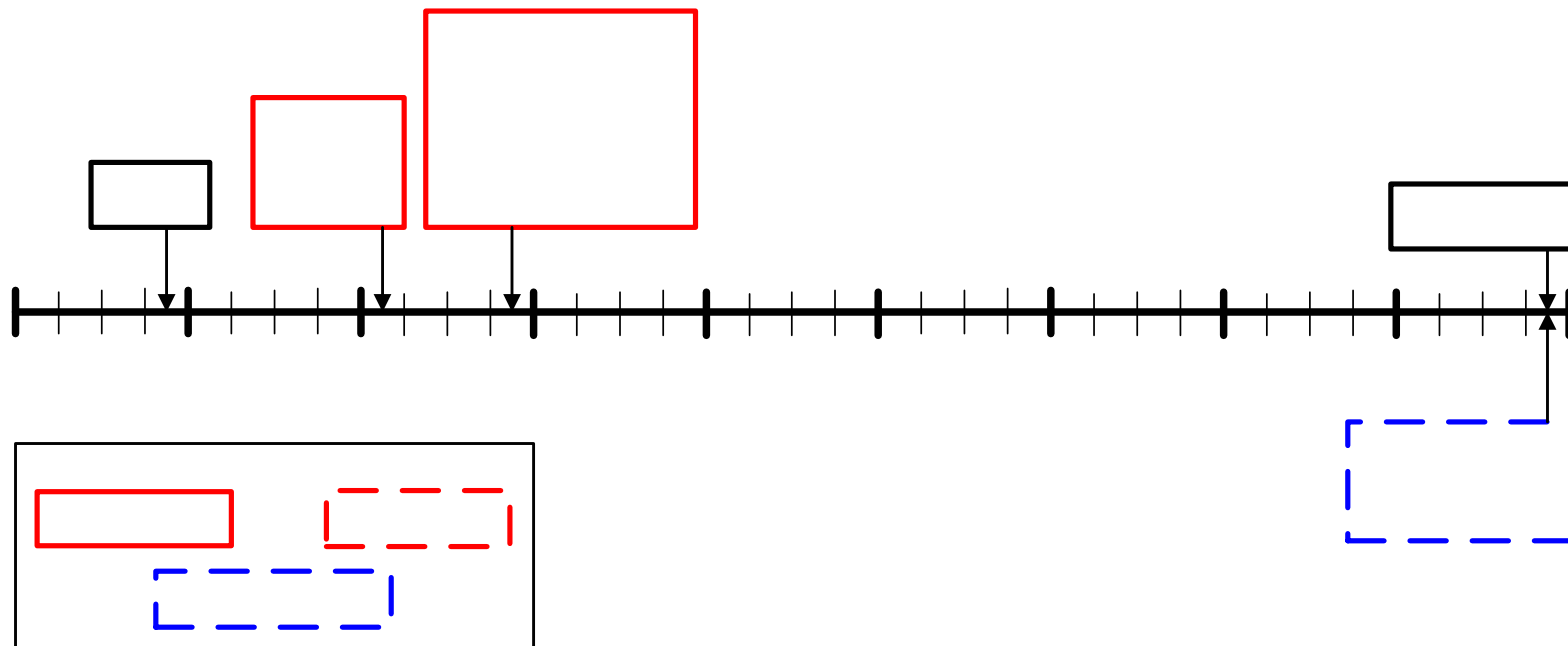
Navajo-Montana FCCU Emissions Reduction Compliance Dates

DOL Dec 2001	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015
Navajo Artesia															
FCCU SO ₂															
FCCU NO _x															
Montana Great Falls															
FCCU SO ₂															
FCCU NO _x															

Notes:
SO₂: □=interim hard limit, ■= final hard limits, □= hardware installation, ■= hardware limits effective, □= start of additives, ■= additives demonstration report deadline, Slashes (/) indicate combinations (e.g. either additives or hard limits).
NO_x: △= interim hard limit, ▲= hard limits, △= hardware installation, ▲= hardware limits effective, △= start of additives and/or low NOx COPs, ▲= additives demonstration report deadline , Slashes (/) indicate combinations (e.g. either additives or hard limits).



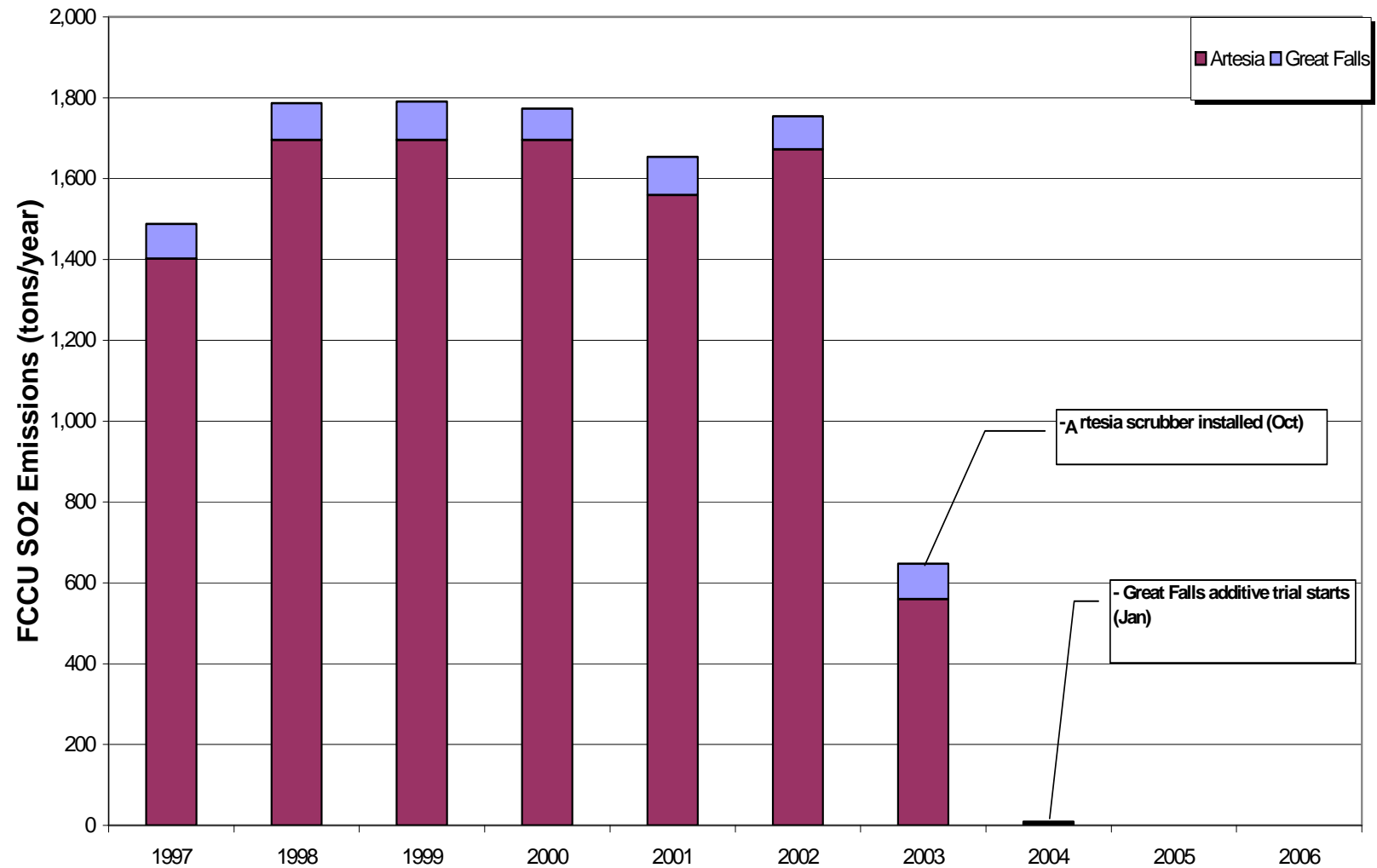
Navajo-Montana Emissions Controls Milestones





Navajo-Montana Actual FCCU SO2 Emissions

Date of Lodging: 12/20/2001

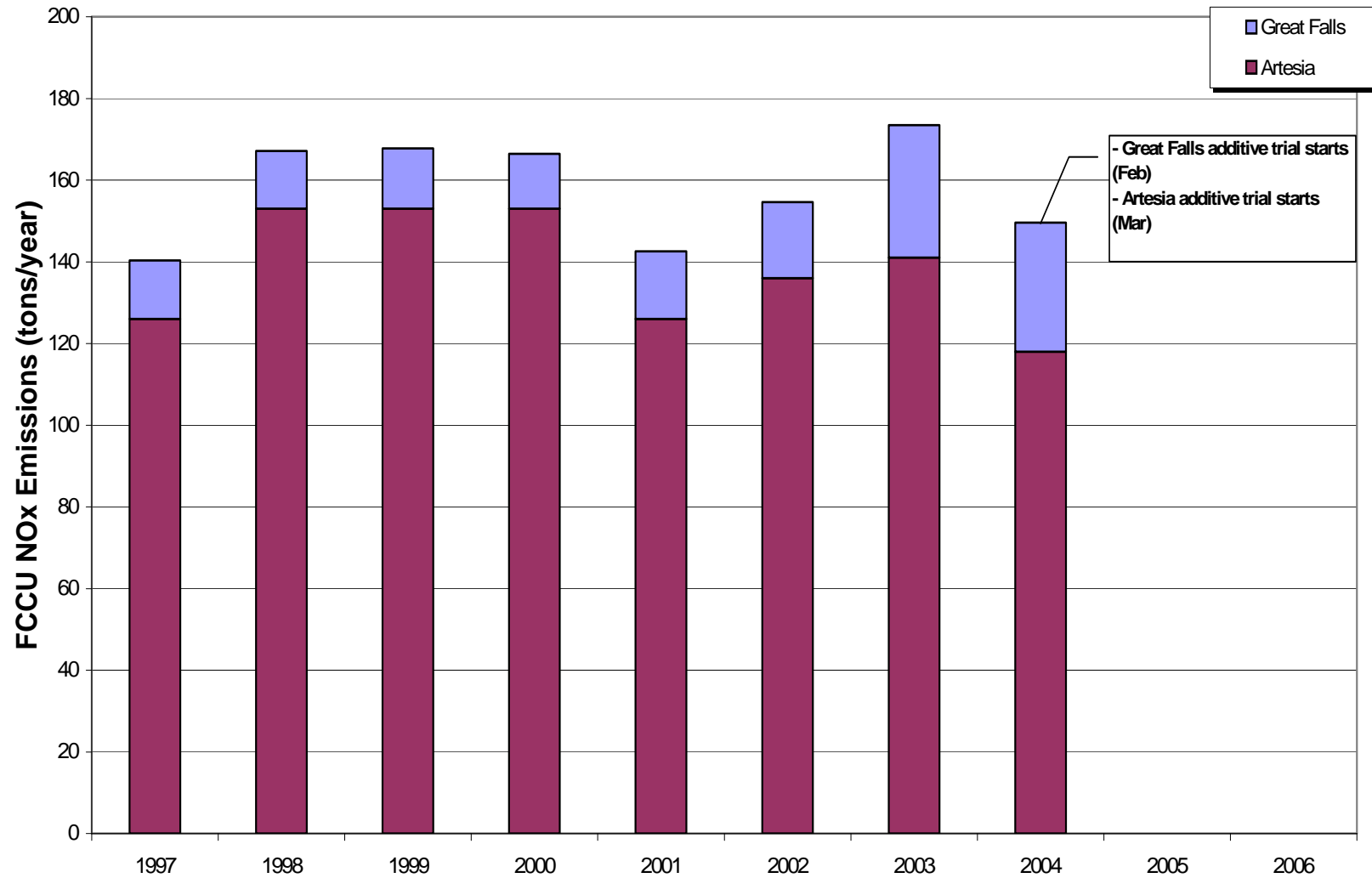


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Navajo-Montana Actual FCCU NOx Emissions

Date of Lodging: 12/20/2001



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Lion Oil

May 2003

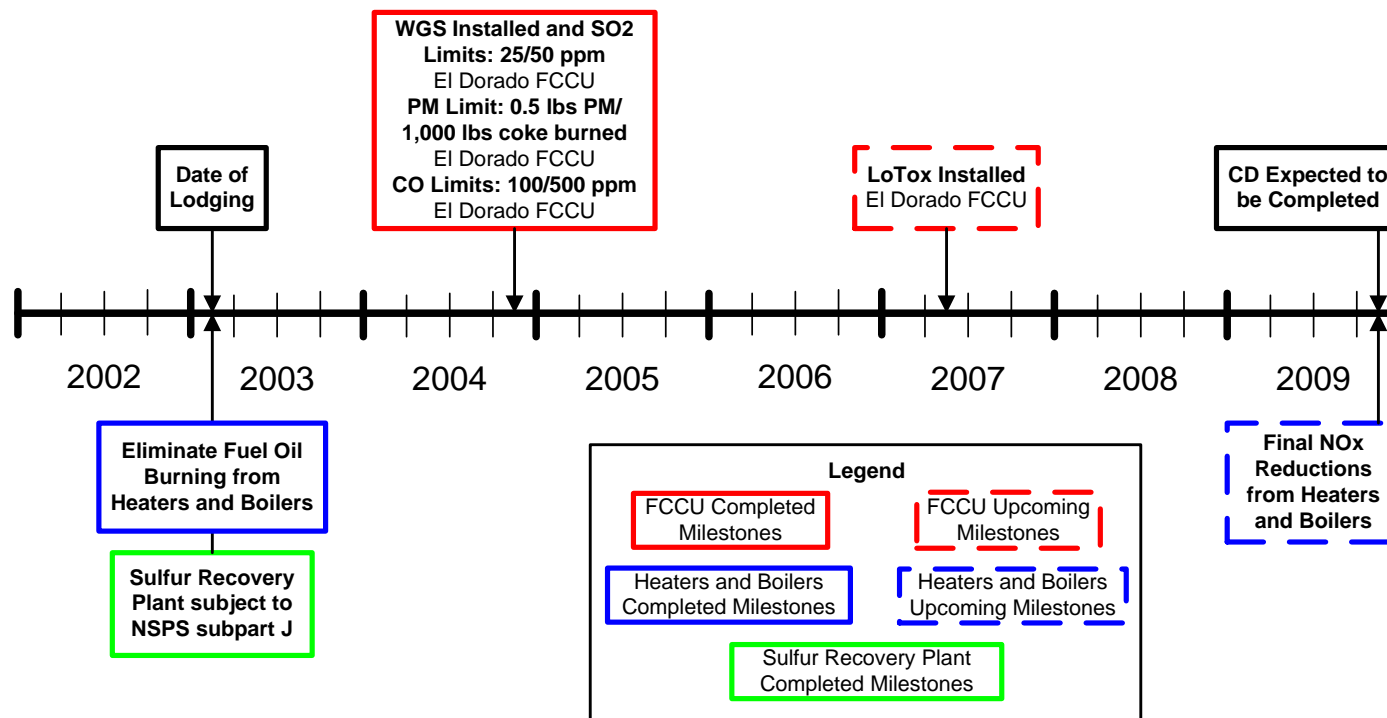
- 1 refinery in Arkansas
- \$21.5 million in injunctive relief
- Annual Reductions
 - 530 tons of NO_x
 - 650 tons of SO₂
- Penalty: \$348,000
- SEPs: \$450,000
- Co-Plaintiffs: Arkansas

Lion Oil FCCU Emissions Reduction Compliance Dates

DOL Mar 2003	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015
El Dorado															
FCCU SO ₂															
FCCU NO _x															

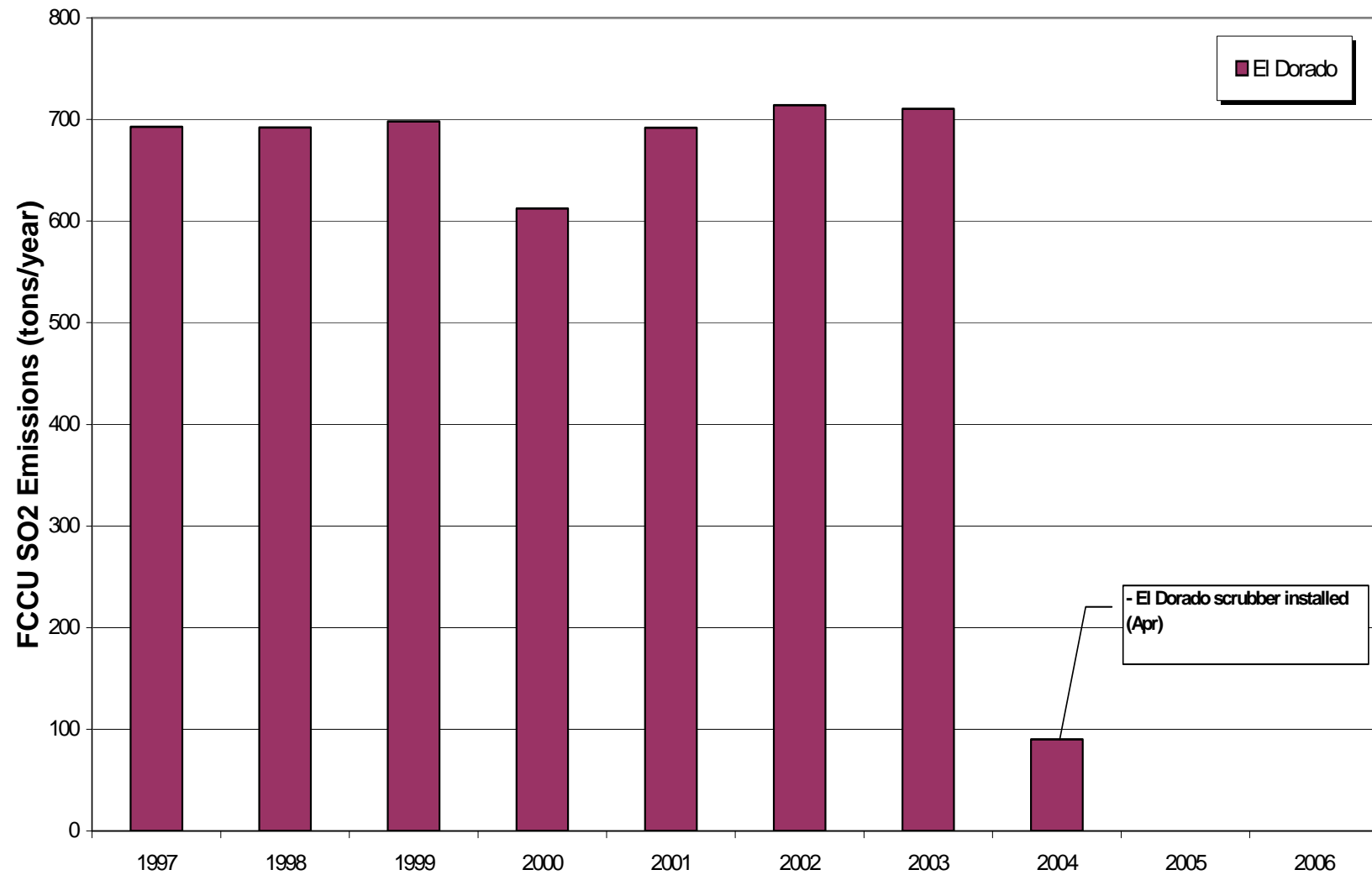
Notes:
SO₂: □=interim hard limit, ■= final hard limits, □= hardware installation, ■= hardware limits effective, □= start of additives, ■= additives demonstration report deadline, Slashes (/) indicate combinations (e.g. either additives or hard limits).
NO_x: ▲= interim hard limit, ▲= hard limits, ▲= hardware installation, ▲= hardware limits effective, ▲= start of additives and/or low NOx COPs, ▲= additives demonstration report deadline, Slashes (/) indicate combinations (e.g. either additives or hard limits).

Lion Oil Emissions Controls Milestones





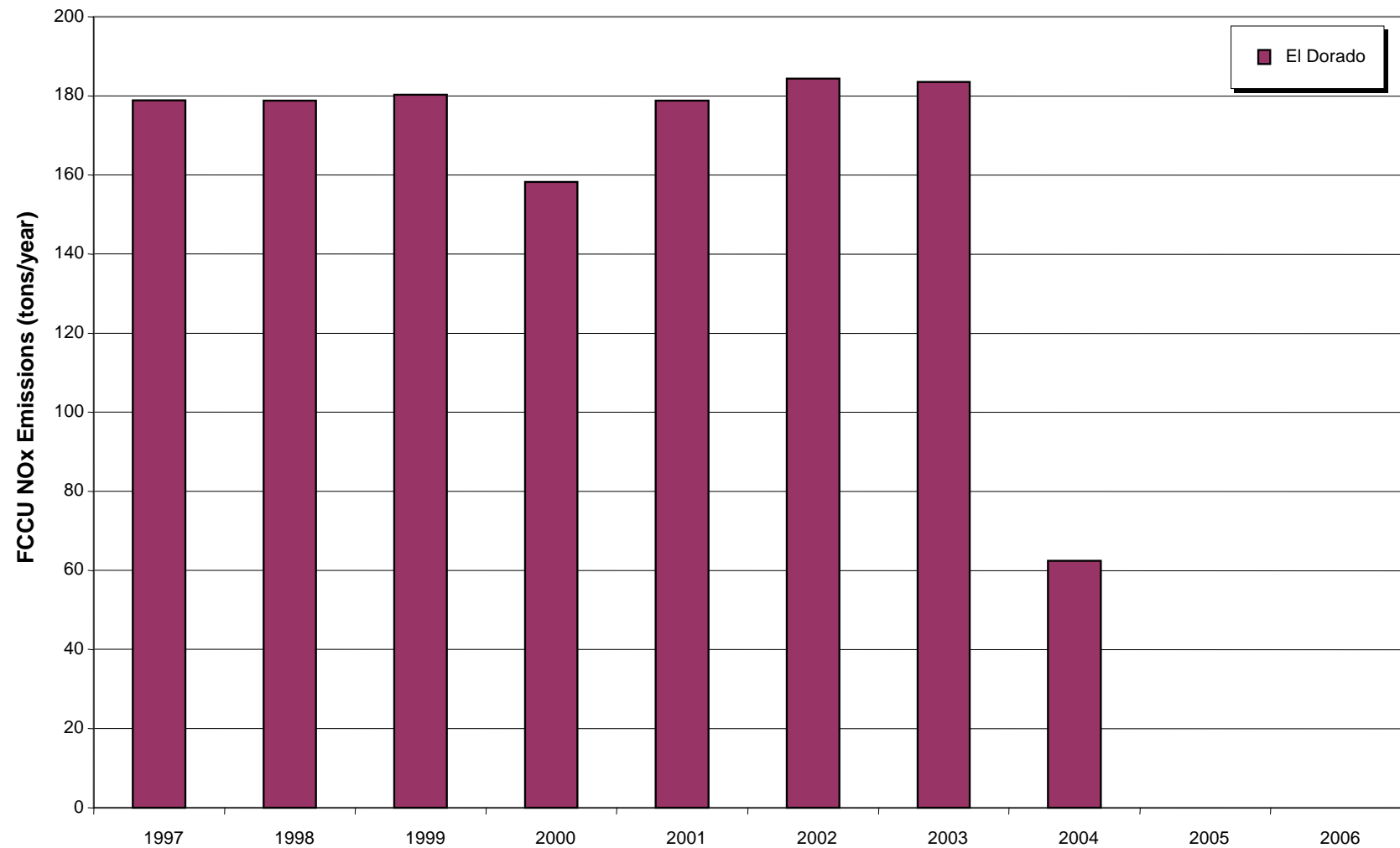
Lion Actual FCCU SO2 Emissions Date of Lodging: 3/11/2003





Lion Actual FCCU NOx Emissions

Date of Lodging: 3/11/2003



Updated 03/21/06 - Subject to Revision



CHS-Coastal-Ergon

October 2003

- 4 refineries in Mississippi, Montana, New Jersey and West Virginia
- Annual Reductions
 - 1,100 tons of NO_x
 - 2,800 tons of SO₂
- Penalty: \$2.9 million
- SEPs: \$1.6 million
- Co-Plaintiffs: Montana (CHS), New Jersey (Coastal), Mississippi Commission on Environmental Quality and West Virginia Department of Environmental Protection (Ergon)
- Sunoco, Inc. acquired the Eagle Point (Westville, New Jersey) refinery in 2004

CHS FCCU Emissions Reduction Compliance Dates

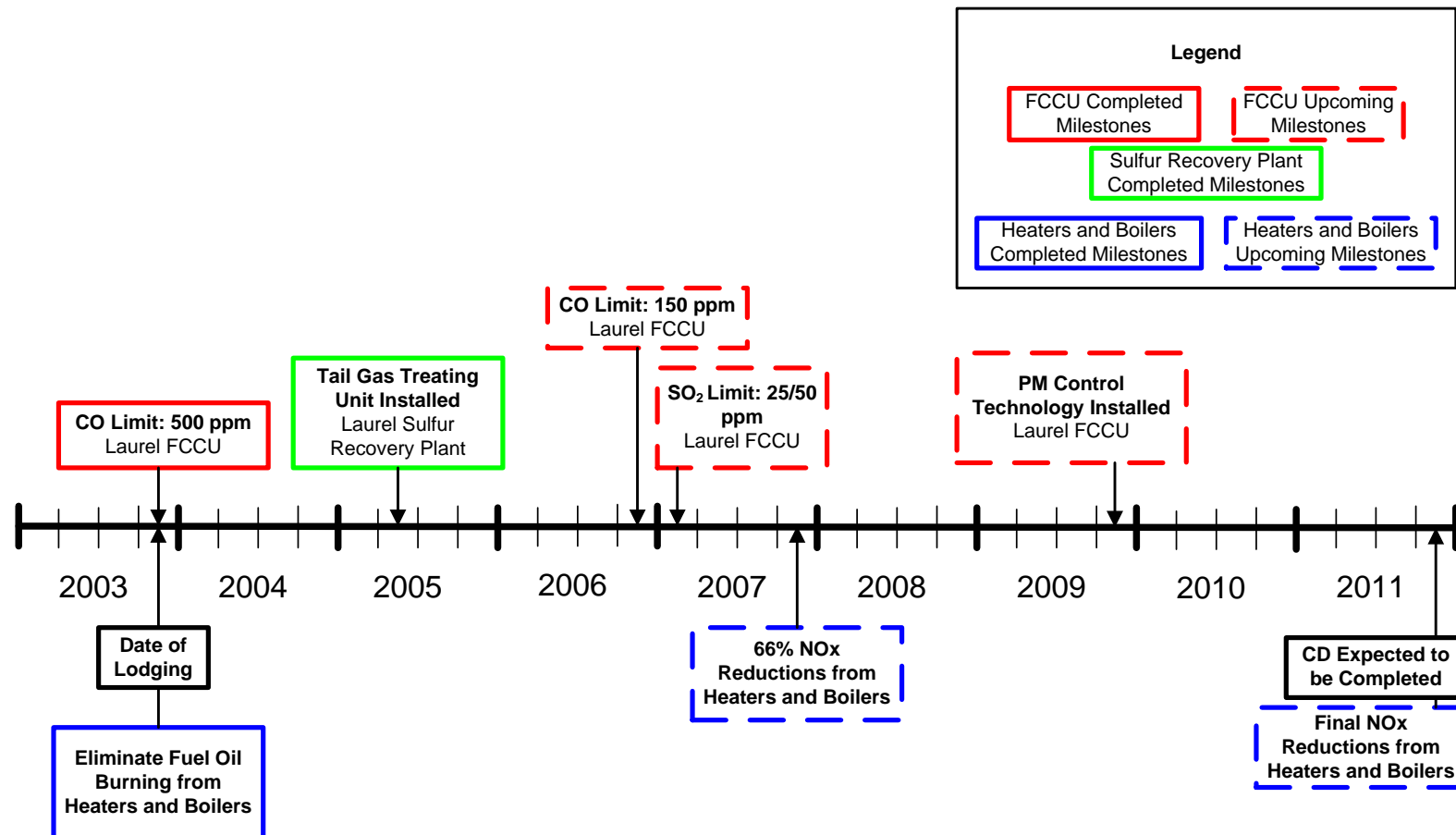
DOL Oct 2003	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015
Laurel															
FCCU SO ₂															
FCCU NO _x															

Notes:
SO₂: □=interim hard limit, ■= final hard limits, □= hardware installation, ■= hardware limits effective, □= start of additives, ■= additives demonstration report deadline, Slashes (/) indicate combinations (e.g. either additives or hard limits).
NO_x: △= interim hard limit, ▲= hard limits, ▲= hardware installation, ▲= hardware limits effective, ▲= start of additives and/or low NOx COPs, ▲= additives demonstration report deadline, Slashes (/) indicate combinations (e.g. either additives or hard limits).

Footnotes:

¹Laurel: If WGS is necessary to meet the hard limit, the limit will become effective 12/2009.

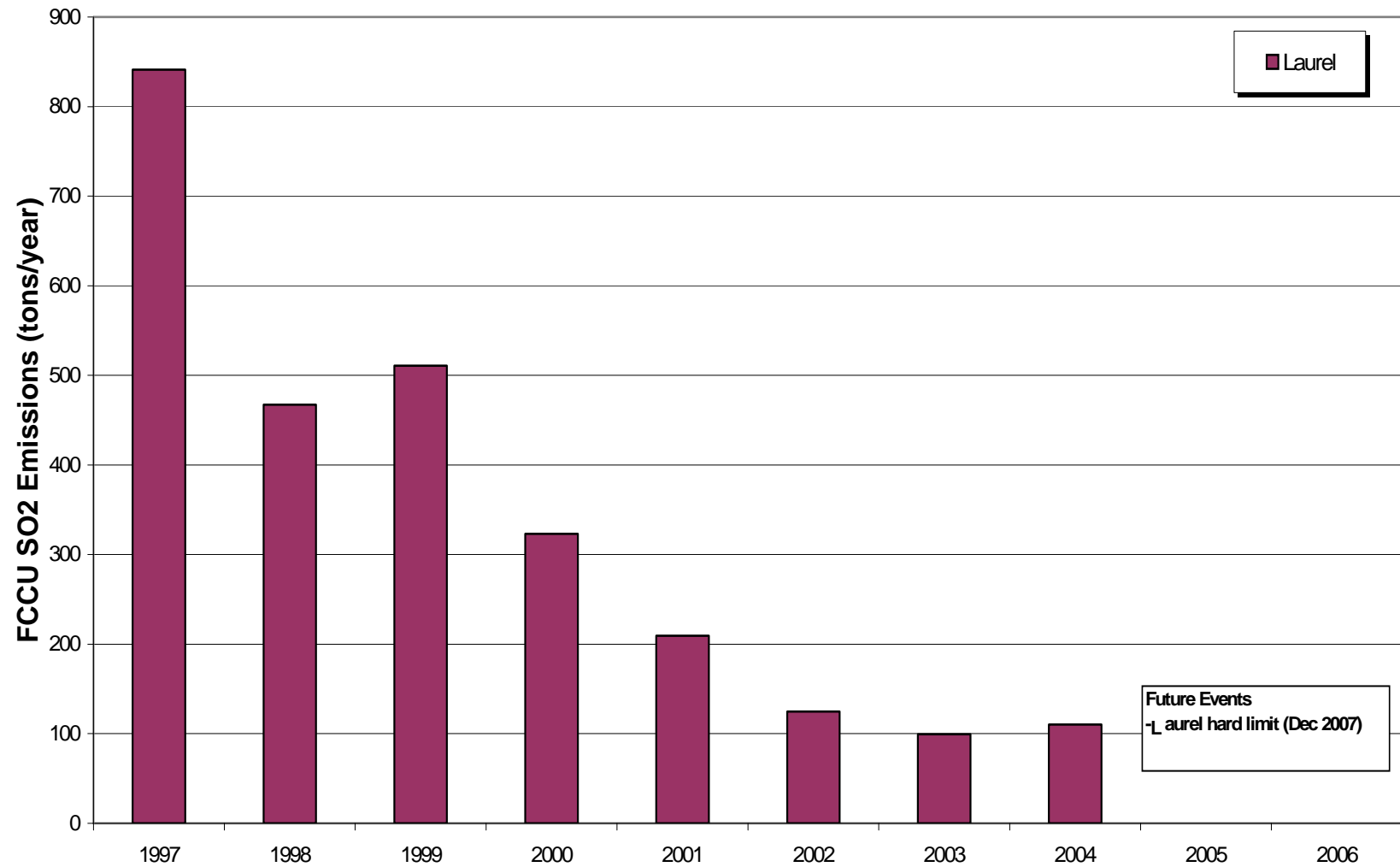
CHS Emissions Controls Milestones





CHS Actual FCCU SO2 Emissions

Date of Lodging: 9/30/2003

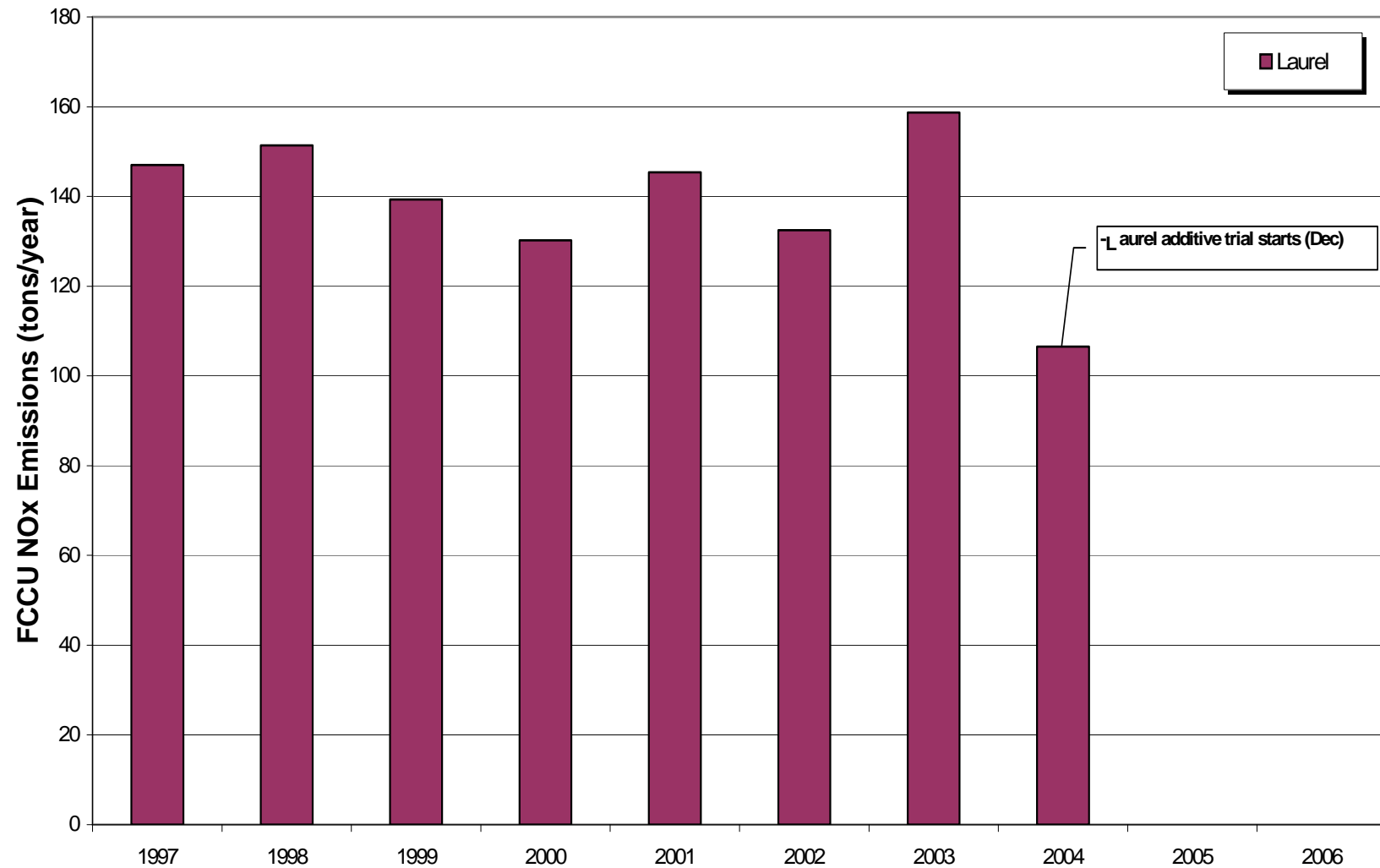


Updated 03/21/06 - Subject to Revision



CHSA ctual FCCU NOx Emissions

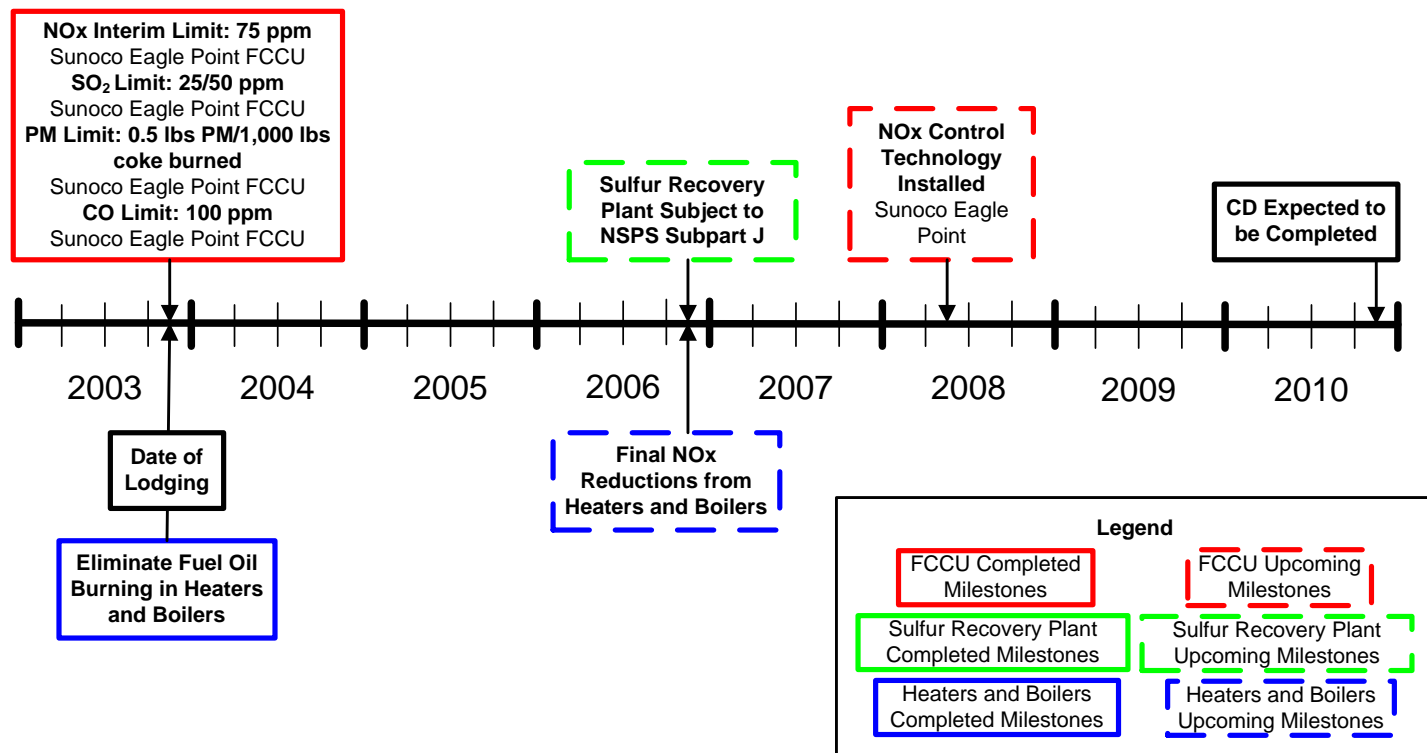
Date of Lodging: 9/30/2003



CEPOC FCCU Emissions Reduction Compliance Dates

DOL Oct 2003	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015
Sunoco Eagle Point FCCU SO ₂				■											
FCCU NO _x				△△		▲									
Notes: SO ₂ : □=interim hard limit, ■= final hard limits, □= hardware installation, ■= hardware limits effective, □= start of additives, ■= additives demonstration report deadline, Slashes (/) indicate combinations (e.g. either additives or hard limits). NO _x : △= interim hard limit, ▲ = hard limits, △= hardware installation, ▲ = hardware limits effective, △= start of additives and/or low NOx COPs, ▲ = additives demonstration report deadline , Slashes (/) indicate combinations (e.g. either additives or hard limits).															

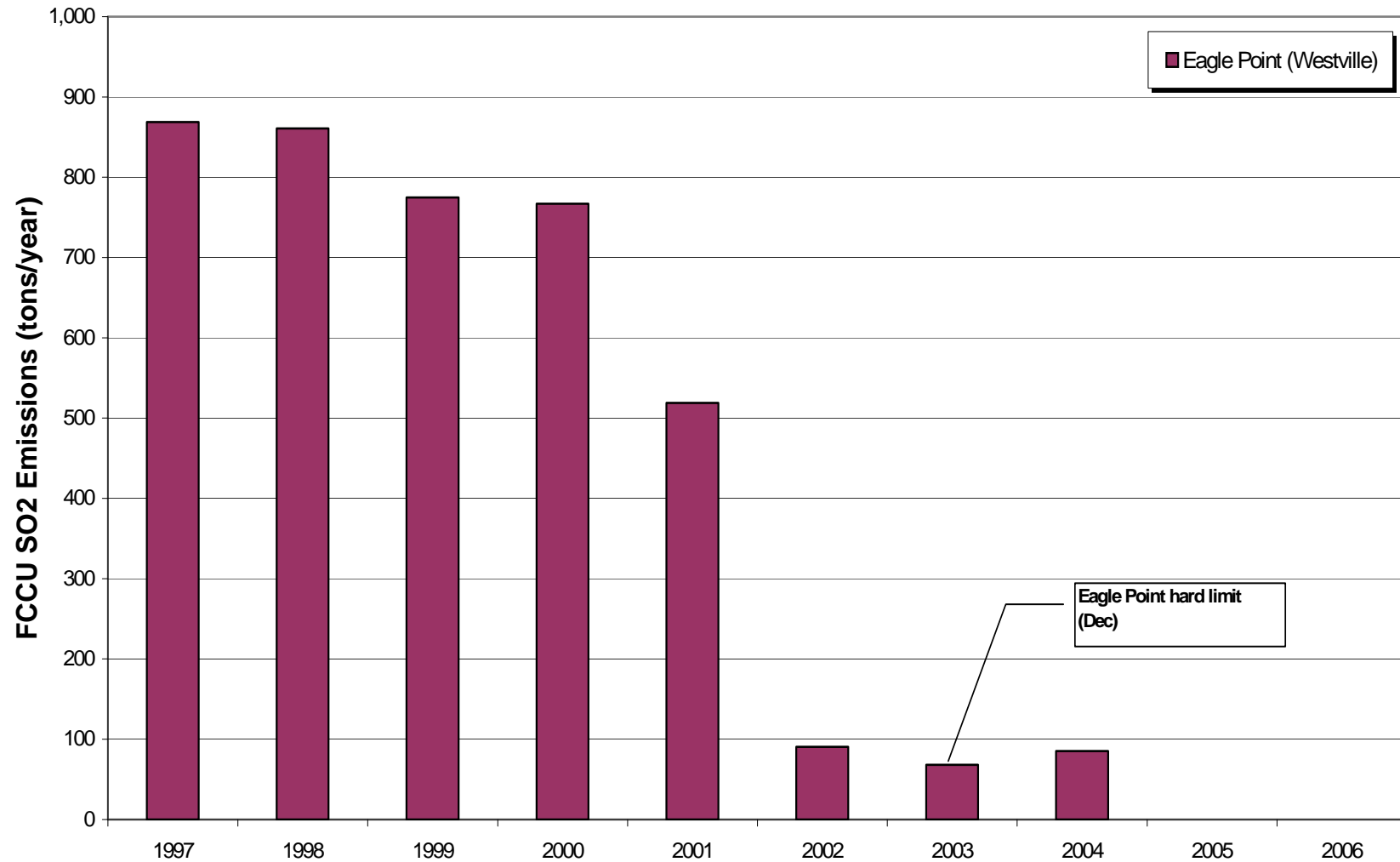
CEPOC Emissions Controls Milestones





Coastal Actual FCCU SO₂ Emissions

Date of Lodging: 9/30/2003

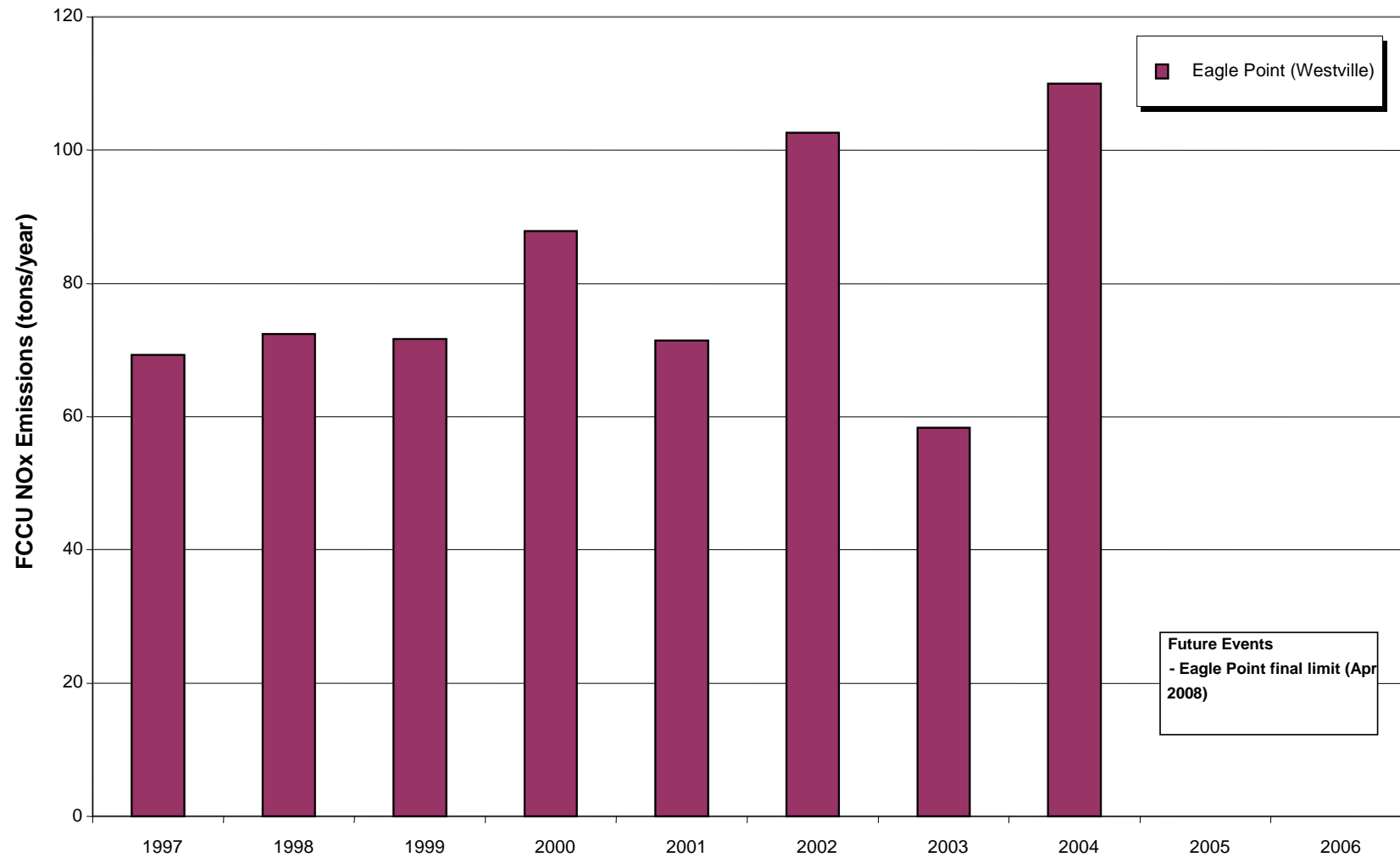


Updated 03/21/06 - Subject to Revision



Coastal Actual FCCU NOx Emissions

Date of Lodging: 9/30/2003



Updated 03/21/06 - Subject to Revision



Recent Settlements

Chevron

October 2003

- 5 refineries in California, Mississippi, Utah and Hawaii
- \$275 million in injunctive relief
- Annual Reductions
 - 3,300 tons of NO_x
 - 6,300 tons of SO₂
- Penalty: \$3.5 million
- SEPs: \$4 million
- Co-Plaintiffs: Hawaii, Mississippi Commission on Environmental Quality, Utah and Bay Area Air Quality Management District

Chevron FCCU Emissions Reduction Compliance Dates

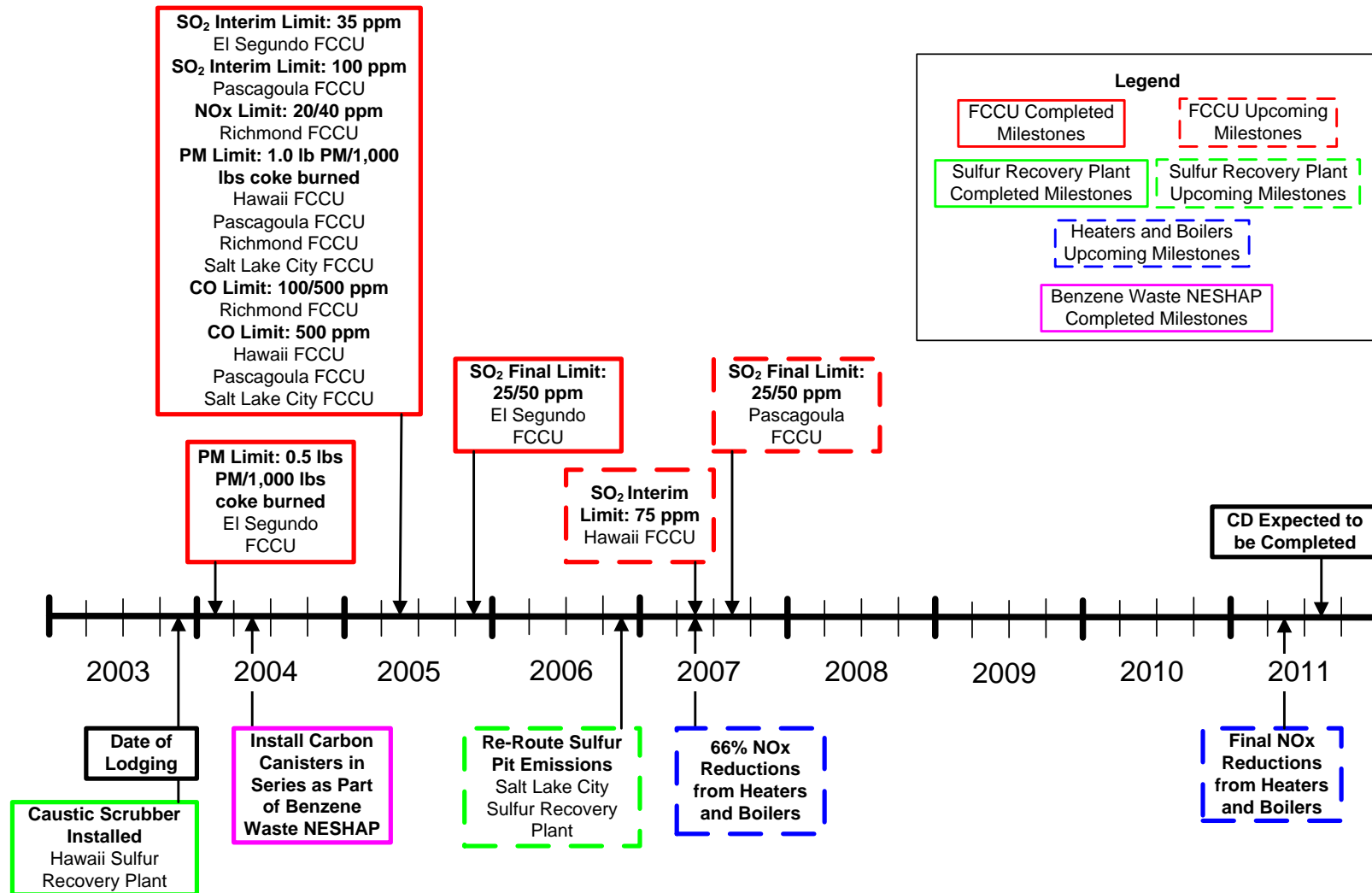
	DOL Oct 2003	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015
El Segundo	FCCU SO ₂			□		■										
	FCCU NO _x								▲							
Hawaii	FCCU SO ₂						□	□				■				
	FCCU NO _x								Δ			▲				
Pascagoula	FCCU SO ₂					□		■								
	FCCU NO _x					Δ			▲							
Richmond	FCCU SO ₂						□		■							
	FCCU NO _x			▲												
Salt Lake City	FCCU SO ₂								■							
	FCCU NO _x							Δ			▲					

Notes:
SO₂: □=interim hard limit, ■= final hard limits, □= hardware installation, ■= hardware limits effective, □= start of additives, ■= additives demonstration report deadline, Slashes (/) indicate combinations (e.g. either additives or hard limits).
NO_x: Δ= interim hard limit, ▲= hard limits, Δ= hardware installation, ▲= hardware limits effective, Δ= start of additives and/or low NOx COPs, ▲= additives demonstration report deadline, Slashes (/) indicate combinations (e.g. either additives or hard limits).

Footnotes:

¹Salt Lake City: If feed hydrotreating and SO₂ additives are unable to meet the 12/2008 hard limit, WGS must be used to meet the hard limit by 12/2010.

Chevron Emissions Controls Milestones





Recent Settlements

CITGO

October 2004

- 5 refineries in Georgia, Texas, Louisiana and New Jersey
- \$320 million in injunctive relief
- Annual Reductions
 - 7,100 tons of NO_x
 - 23,250 tons of SO₂
- Penalty: \$3.6 million
- SEPs: \$5 million
- Co-Plaintiffs: Georgia, Illinois, Louisiana and New Jersey

CITGO FCCU Emissions Reduction Compliance Dates

DOL Oct 2004	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015
Corpus Christi East 1															
FCCU SO ₂									□				■		
FCCU NO _x								Δ					▲		
Corpus Christi East 2															
FCCU SO ₂							□			■					
FCCU NO _x					Δ		▲								
Lake Charles A															
FCCU SO ₂							□					■			
FCCU NO _x							Δ					▲			
Lake Charles B															
FCCU SO ₂						□■									
FCCU NO _x							Δ			▲					
Lake Charles C															
FCCU SO ₂							□■								
FCCU NO _x							Δ			▲					
Lemont															
FCCU SO ₂							□■								
FCCU NO _x									Δ				▲		

Notes:

SO₂: □=interim hard limit, ■= final hard limits, □= hardware installation, ■= hardware limits effective, □= start of additives, ■= additives demonstration report deadline, Slashes (/) indicate combinations (e.g. either additives or hard limits).

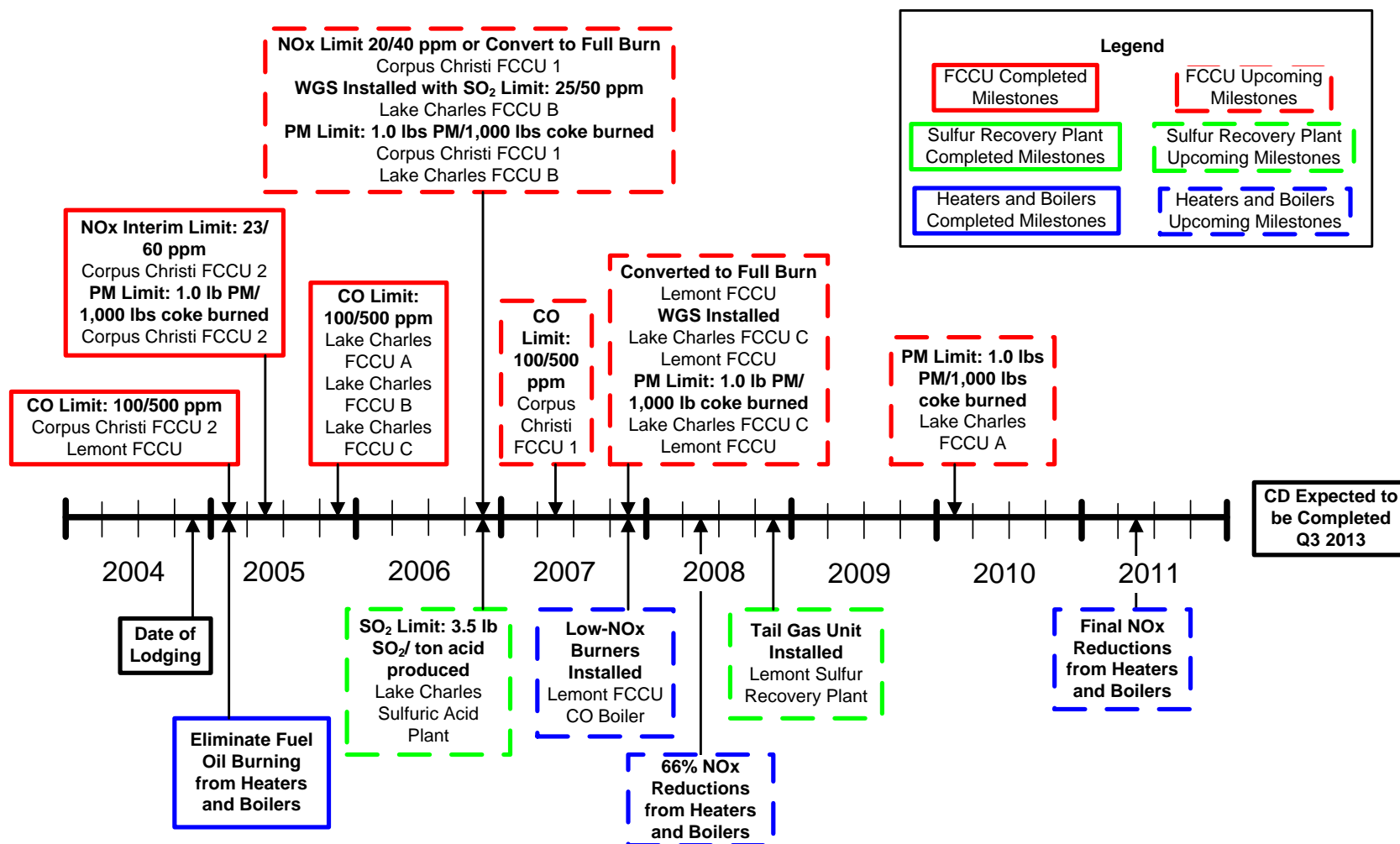
NO_x: Δ= interim hard limit, ▲= hard limits, Δ= hardware installation, ▲= hardware limits effective, Δ= start of additives and/or low NOx COPs, ▲= additives demonstration report deadline, Slashes (/) indicate combinations (e.g. either additives or hard limits).

Footnotes:

Corpus Christi East 1: If FCCU is not converted to full-burn, hard limits are effective 12/31/2006.

Lemont: If FCCU is not converted to full-burn, hard limits are effective 12/31/2007.

CITGO Emissions Controls Milestones





Recent Settlements

ConocoPhillips

January 2005

- 11 refineries in Louisiana, New Jersey, Washington, Texas, California, Pennsylvania and Illinois
- \$525 million for injunctive relief
- Annual Reductions
 - 10,000 tons of NO_x
 - 37,100 tons of SO₂
- Penalty: \$4.5 million
- SEPs: \$10 million
- Co-Plaintiffs: Illinois, Louisiana, New Jersey, Commonwealth of Pennsylvania and Northwest Clean Air Agency

ConocoPhillips FCCU Emissions Reduction Compliance Dates

DOL Jan 2005	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015
Alliance															
FCCU SO ₂									□■						
FCCU NO _x												△			▲ ¹
Bayway															
FCCU SO ₂					■										
FCCU NO _x						△			▲						
Borger 29															
FCCU SO ₂							■ ²								
FCCU NO _x								△				▲ ³			
Borger 40															
FCCU SO ₂							■ ²								
FCCU NO _x								△				▲ ³			
Ferndale															
FCCU SO ₂					■										
FCCU NO _x										△				▲	
Los Angeles-Wilmington								□			■				
FCCU SO ₂															
FCCU NO _x						△					▲				
Sweeny 3															
FCCU SO ₂									□			■			
FCCU NO _x									▲▲						
Sweeny 27															
FCCU SO ₂							□			■					
FCCU NO _x							△					▲			
Trainer															
FCCU SO ₂						□■									
FCCU NO _x							△		▲						
Wood River 1									□■						
FCCU SO ₂															
FCCU NO _x										△			▲		
Wood River 2															
FCCU SO ₂												□■			
FCCU NO _x												△			▲

Notes:

SO₂: □=interim hard limit, ■= final hard limits, □= hardware installation, ■= hardware limits effective, □= start of additives, ■= additives demonstration report deadline, Slashes (/) indicate combinations (e.g. either additives or hard limits).

NO_x: △= interim hard limit, ▲= hard limits, △= hardware installation, ▲= hardware limits effective, △= start of additives and/or low NOx COPs, ▲= additives demonstration report deadline, Slashes (/) indicate combinations (e.g. either additives or ha

Footnotes:

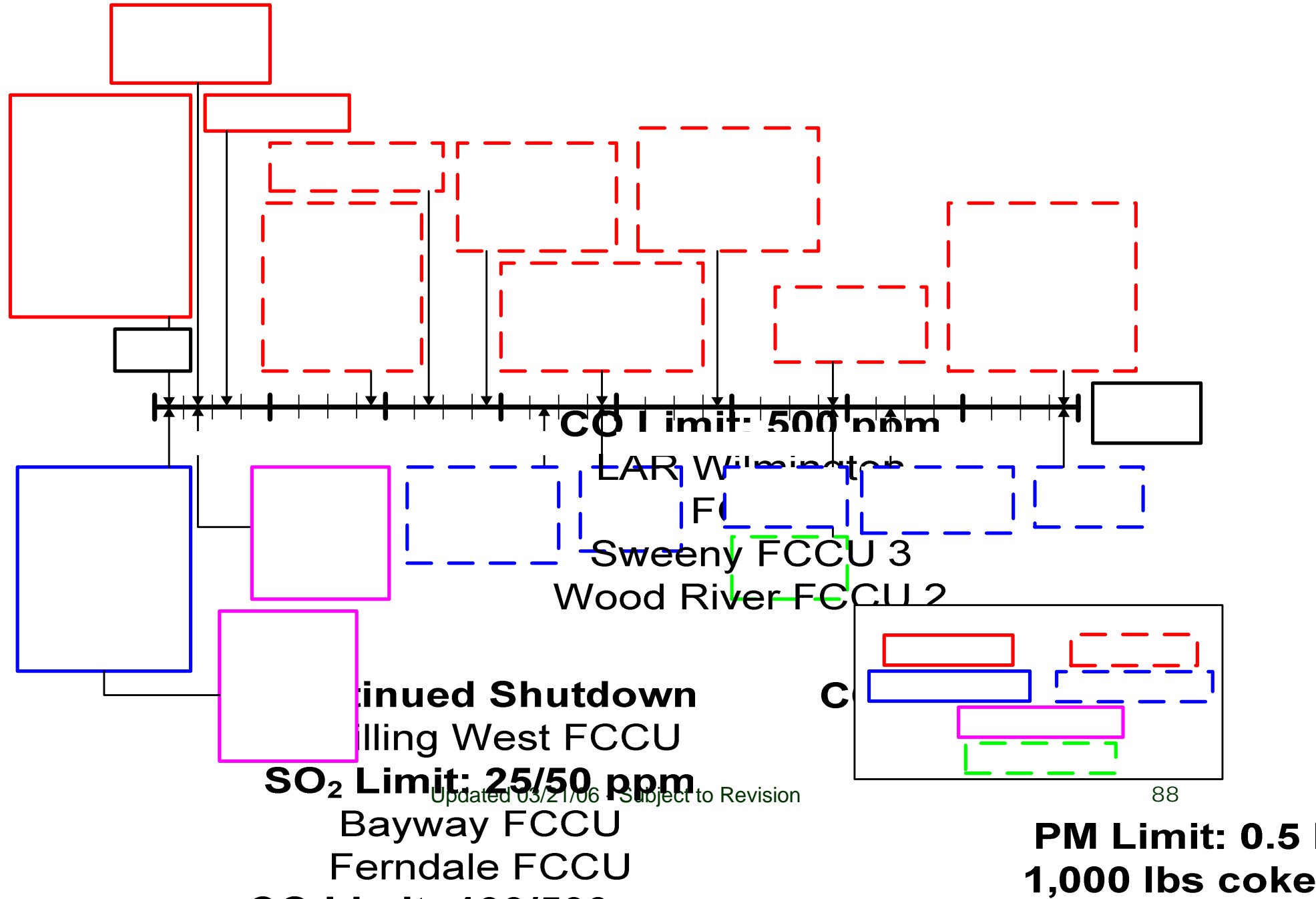
¹Alliance: If SNERT is installed, compliance date is 3/2015; if SNERT is not installed, compliance date is 12/2009.

²Borger 29, Borger 40: ConocoPhillips notified EPA pursuant to paragraph 58 that the CO boilers will be decommissioned, the FCCUs converted to full burn, and the FCCU feed high pressure hydrotreated. ConocoPhillips will take SO₂ hard limits.

³Borger 29, Borger 40: ConocoPhillips notified EPA pursuant to paragraph 39 that the CO boilers will be decommissioned, the FCCUs converted to full burn, and the FCCU feed high pressure hydrotreated. ConocoPhillips will implement a NOx additive program.



ConocoPhillips Emissions Controls Milestones





Recent Settlements

Sunoco

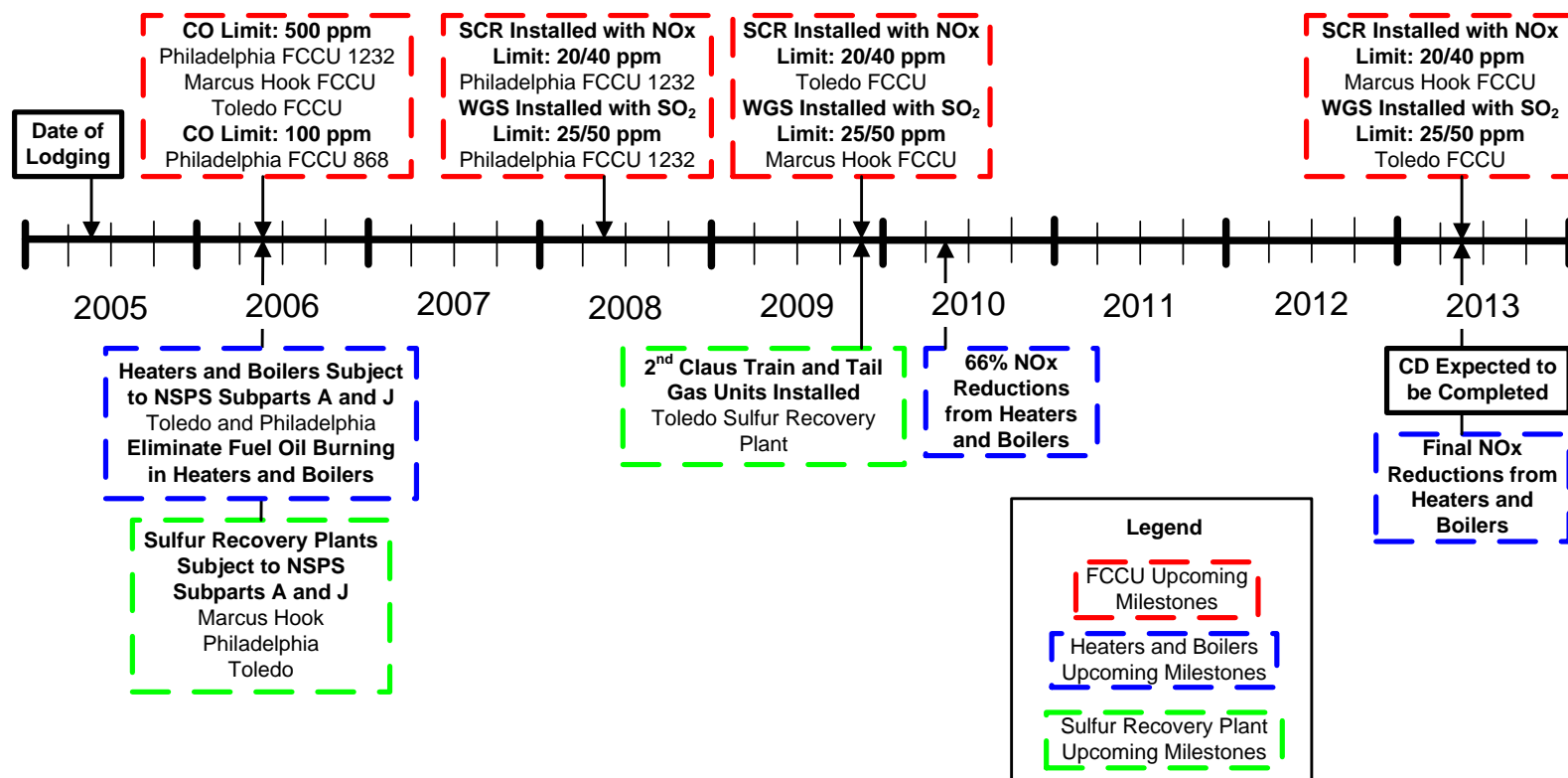
June 2005

- 4 refineries in Pennsylvania, Ohio and Oklahoma
- \$350 million in injunctive relief
- Annual Reductions
 - 49,500 tons of NO_x
 - 19,500 tons of SO₂
- Penalty: \$3 million
- SEPs: \$3.9 million
- Co-Plaintiffs: Pennsylvania, City of Philadelphia, Oklahoma and Ohio

Sunoco FCCU Emissions Reduction Compliance Dates

DOL Jun 2005	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015
Marcus Hook															
FCCU SO ₂													□■		
FCCU NO _x													▲		
Philadelphia 1232															
FCCU SO ₂								□■							
FCCU NO _x								▲							
Philadelphia 868															
FCCU SO ₂															
FCCU NO _x															
Toledo															
FCCU SO ₂									□■						
FCCU NO _x									▲						
Notes: SO ₂ : □=interim hard limit, ■= final hard limits, □= hardware installation, ■= hardware limits effective, □= start of additives, ■= additives demonstration report deadline, Slashes (/) indicate combinations (e.g. either additives or hard limits). NO _x : ▲= interim hard limit, ▲= hard limits, ▲= hardware installation, ▲= hardware limits effective, ▲= start of additives and/or low NOx COPs, ▲= additives demonstration report deadline, Slashes (/) indicate combinations (e.g. either additives or ha															

Sunoco Emissions Controls Milestones





Recent Settlements

Valero

June 2005

- 14 refineries in California, Colorado, Louisiana, New Jersey, Oklahoma and Texas
- \$700 million in injunctive relief
- Annual Reductions
 - 4,000 tons of NO_x
 - 16,000 tons of SO₂
- Penalty: \$5.5 million
- SEPs: \$5.5 million
- Co-Plaintiffs: Colorado, Louisiana, New Jersey, Oklahoma and Texas
- Suncor Energy (U.S.A.) Inc. acquired the Denver, Colorado refinery in 2005 (integrated with adjacent refinery previously acquired from ConocoPhillips in 2003)

Valero FCCU Emissions Reduction Compliance Dates

DOL Jun 2005	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015
Ardmore FCCU SO ₂					□■										
Benicia FCCU FCCU SO ₂								□		■					
Benicia Coker FCCU SO ₂											□■	■			
Corpus Christi East FCCU SO ₂							□				■ ²				
Corpus Christi West FCCU SO ₂					■										
Denver FCCU SO ₂							□				■ ²				
Houston FCCU SO ₂							□■								
Houston FCCU NO _x							△▲								
Krotz Springs FCCU SO ₂							□					■			
McKee FCCU FCCU SO ₂							□				■				
McKee Sulfuric Acid Plant FCCU SO ₂							□■								
Paulsboro FCCU SO ₂						■ ¹									
Paulsboro FCCU NO _x							▲								
St. Charles FCCU SO ₂					■										
St. Charles FCCU NO _x						▲									
Texas City FCCU SO ₂						■ ¹									
Texas City FCCU NO _x							△▲								
Three Rivers FCCU SO ₂						□■									
Wilmington FCCU SO ₂							□				■ ²				
Wilmington FCCU NO _x						▲									
Tesoro Golden Eagle FCCU SO ₂						■									
Tesoro Golden Eagle FCCU NO _x						▲									

Notes:

SO₂: □=interim hard limit, ■= final hard limits, □= hardware installation, ■= hardware limits effective, □= start of additives, ■= additives demonstration report deadline, Slashes (/) indicate combinations (e.g. either additives or hard limits).

NO_x: △= interim hard limit, ▲= hard limits, △= hardware installation, ▲= hardware limits effective, △= start of additives and/or low NO_x COPs, ▲= additives demonstration report deadline, Slashes (/) indicate combinations (e.g. either additives or ha

Footnotes:

¹Paulsboro, Texas City: Compliance dates for WGS and SO₂ final limits are based on Date of Entry; timeline assumes Consent Decree will be entered by the end of the second quarter 2006.

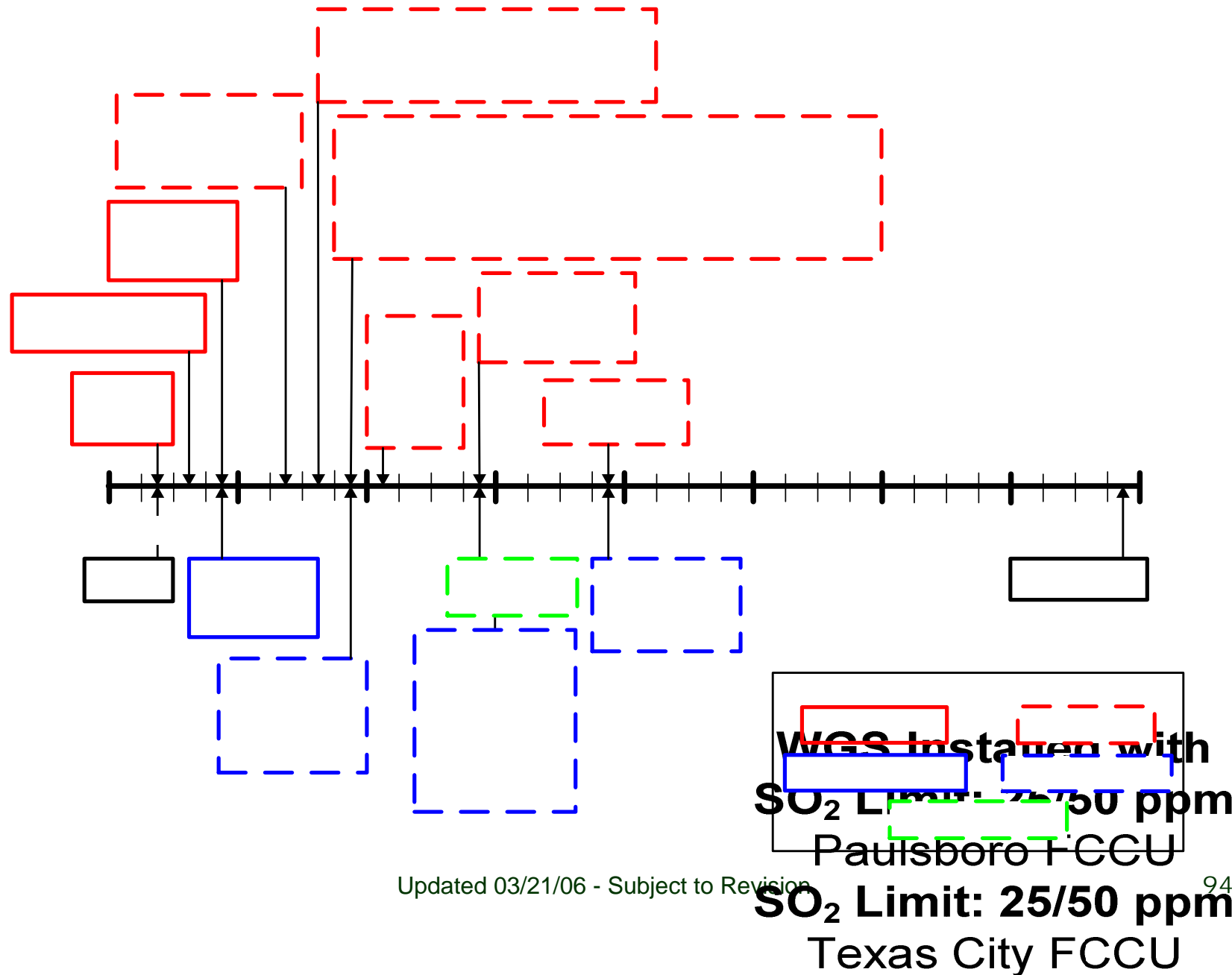
²Corpus Christi East, Denver, Wilmington: One refinery must install WGS to meet hard limits in 2010 while the other refineries must use SO₂ reducing additives. A non-selected refinery can take hard limits in lieu of using additives.

By 12/2010 one of the ultra-low NO_x regenerators at either Paulsboro, St. Charles, or Wilmington must meet hard limits for NO_x.

System wide coke burn-weighted average NO_x interim limit must be effective 3/2009 to include Ardmore, Corpus Christi East, Corpus Christi West, Denver, Houston, Krotz Springs, McKee, Paulsboro, St. Charles, Texas City, Three Rivers, Wilmington, and Tesoro Golden Eagle. The final system wide coke-burn weighted average NO_x limit is effective 3/2012.

Updated 03/21/06 - Subject to Revision

Valero Emissions Controls Milestones





Recent Settlements

ExxonMobil

October 2005

- 7 refineries in California, Illinois, Montana, Texas and Louisiana
- \$570 million in injunctive relief
- Annual Reductions
 - 11,000 tons of NO_x
 - 42,000 tons of SO₂
- Penalty: \$8.7 million
- SEPs: \$9.7 million
- Co-Plaintiffs: Illinois, Louisiana and Montana

ExxonMobil FCCU Emissions Reduction Compliance Dates

DOL Oct 2005	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015
Baton Rouge															
FCCU SO ₂						■									
FCCU NO _x								▲ ²							
Baytown 2															
FCCU SO ₂										■					
FCCU NO _x						△				▲					
Baytown 3															
FCCU SO ₂						■ ¹									
FCCU NO _x						△				▲					
Beaumont															
FCCU SO ₂						■ ¹									
FCCU NO _x								▲		▲					
Billings															
FCCU SO ₂						□							■		
FCCU NO _x								▲							
Joliet															
FCCU SO ₂								■							
FCCU NO _x													▲		
Torrance															
FCCU SO ₂						■ ¹									
FCCU NO _x						▲ ²									
Chalmette															
FCCU SO ₂						■									
FCCU NO _x								▲ ³							

Notes:

SO₂: □=interim hard limit, ■= final hard limits, □= hardware installation, ■= hardware limits effective, □= start of additives, ■= additives demonstration report deadline, Slashes (/) indicate combinations (e.g. either additives or hard limits).

NO_x: △= interim hard limit, ▲= hard limits, ▲= hardware installation, ▲= hardware limits effective, △= start of additives and/or low NOx COPs, ▲= additives demonstration report deadline, Slashes (/) indicate combinations (e.g. either additives or ha

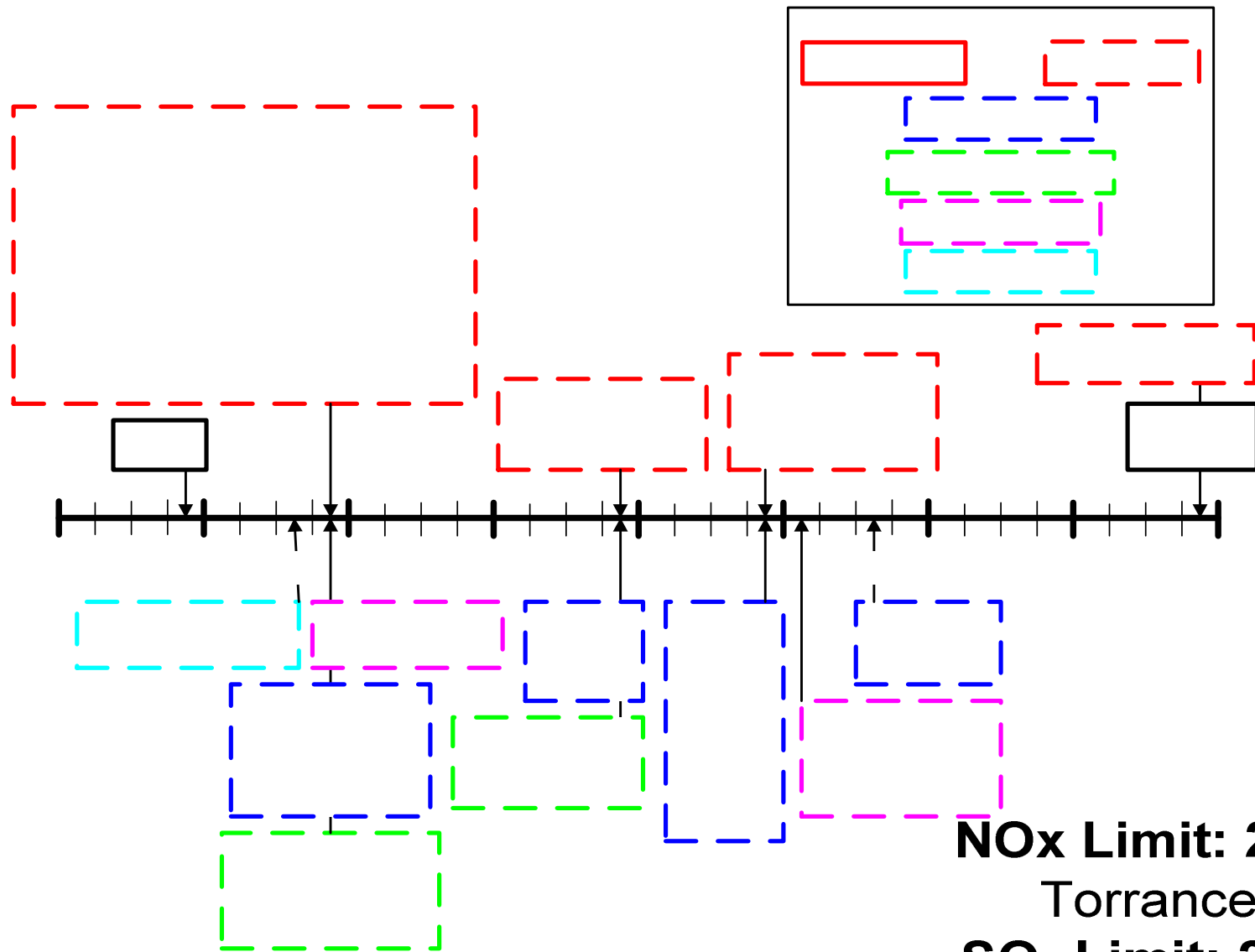
Footnotes:

¹Torrance, Beaumont, Baytown FCCU 3: Compliance dates for SO2 final limits are based on Date of Entry; timeline assumes Consent Decree will be entered by the end of 2006.

²Torrance, Baton Rouge: Compliance dates for NOx final limits are based on Date of Entry; timeline assumes Consent Decree will be entered by the end of 2006.

³Chalmette: If additives are found to be effective, compliance date is 6/30/2007, if additives are not effective, compliance date is 12/31/2008.

ExxonMobil & Chalmette Emissions Controls Milestones



NO_x Limit: 20/40 ppm

Torrance FCCU

SO₂ Limit: 25/50 ppm

Baytown FCCU 3, Beaumont FCCU, Ch

Torrance FCCU

Updated 03/21/06 - Subject to Revision



Petroleum Refinery Initiative

Emissions Monitoring Requirements



Types of Emissions Monitoring Methods

- Continuous Emissions Monitoring System (CEMS)
 - Installed, certified, maintained and operated in accordance with 40 CFR §§ 60.11, 60.13, and Part 60 Appendix A
 - Relative Accuracy Audit (RAA) or Relative Accuracy Test Audit (RATA) conducted once every three years
 - Cylinder Gas Audit (CGA) conducted the quarters when RAA or RATA are not
- Continuous Opacity Monitoring System (COMS)
 - Operate continuous opacity monitoring system (COMS) in accordance with 40 CFR §§ 60.11, 60.13, and Part 60 Appendix A
- Parametric or Predictive Emissions Monitoring System (PEMS)
 - Mathematical model calculating pounds pollutant per mmBTU using heater and boiler operating parameters
 - Consistent with CEMS data frequency requirements of 40 CFR Part 60
- Stack Tests
 - Conducted in accordance with 40 CFR Part 60 Appendix A or EPA-approved alternative method



Fluid Catalytic Cracking Unit (FCCU) Emissions Monitoring

- SO₂, NO_x, CO, and O₂: CEMS
 - CEMS installed prior to conducting performance tests
 - Calibration drifts of CEMS checked daily
 - CEMS sample, analyze, and record data for each successive 15-minute period
 - 1-hour averages computed using the 15-minute CEMS data
- PM: Stack Tests
 - Stack testing according to 40 CFR Part 60 Appendix A Methods 5B or 5F; typically annually, but frequency can vary by consent decree
 - Some consent decrees also require COMS for opacity



Heater and Boiler Emissions Monitoring

- Capacity greater than 150 mmBTU/hr
 - NO_x, CO, and O₂: CEMS
- Capacity between 100 and 150 mmBTU/hr
 - NO_x, CO, and O₂ : CEMS or PEMS
- Capacity less than 100 mmBTU/hr
 - NO_x, CO, and O₂: stack tests or portable continuous analyzer



Sulfur Recovery Plant (SRP)

Emissions Monitoring

- SO₂: CEMS or EPA-approved alternative
 - Monitor and report all excess emissions as required by 40 CFR §§ 60.7(c), 60.13, and 60.105(a)(5), (6), or (7)
 - Develop and implement a Preventative Maintenance and Operation Plan to reduce SO₂ emissions using good air pollution control practices



Hydrocarbon Flare Emissions Monitoring

- One of the following requirements apply:
 - Install and operate CEMS or PEMS
 - Control flaring by operating flare gas recovery system to control continuous or routine flaring
 - Eliminate the routes of generated fuel gases and only flare:
 - Process upset gases;
 - Fuel gas released as a result of relief valve leakage; or
 - Gas released due to a malfunction
 - Eliminate the routes of generated fuel gases and monitor the flare with CEMS or a flow meter



Benzene Emissions Monitoring

- 40 CFR Part 61 Subpart FF Benzene Waste NESHAP (BWON)
 - Sampling for benzene concentration according to 40 CFR §61.355(c)(3)
 - If Total annual benzene (TAB) emissions less than 10 MG/yr, then exempt from BWON
 - If TAB emissions greater than 10 MG/yr, then develop and implement a plan identifying a strategy to ensure compliance with BWON



Leak Detection and Repair (LDAR)

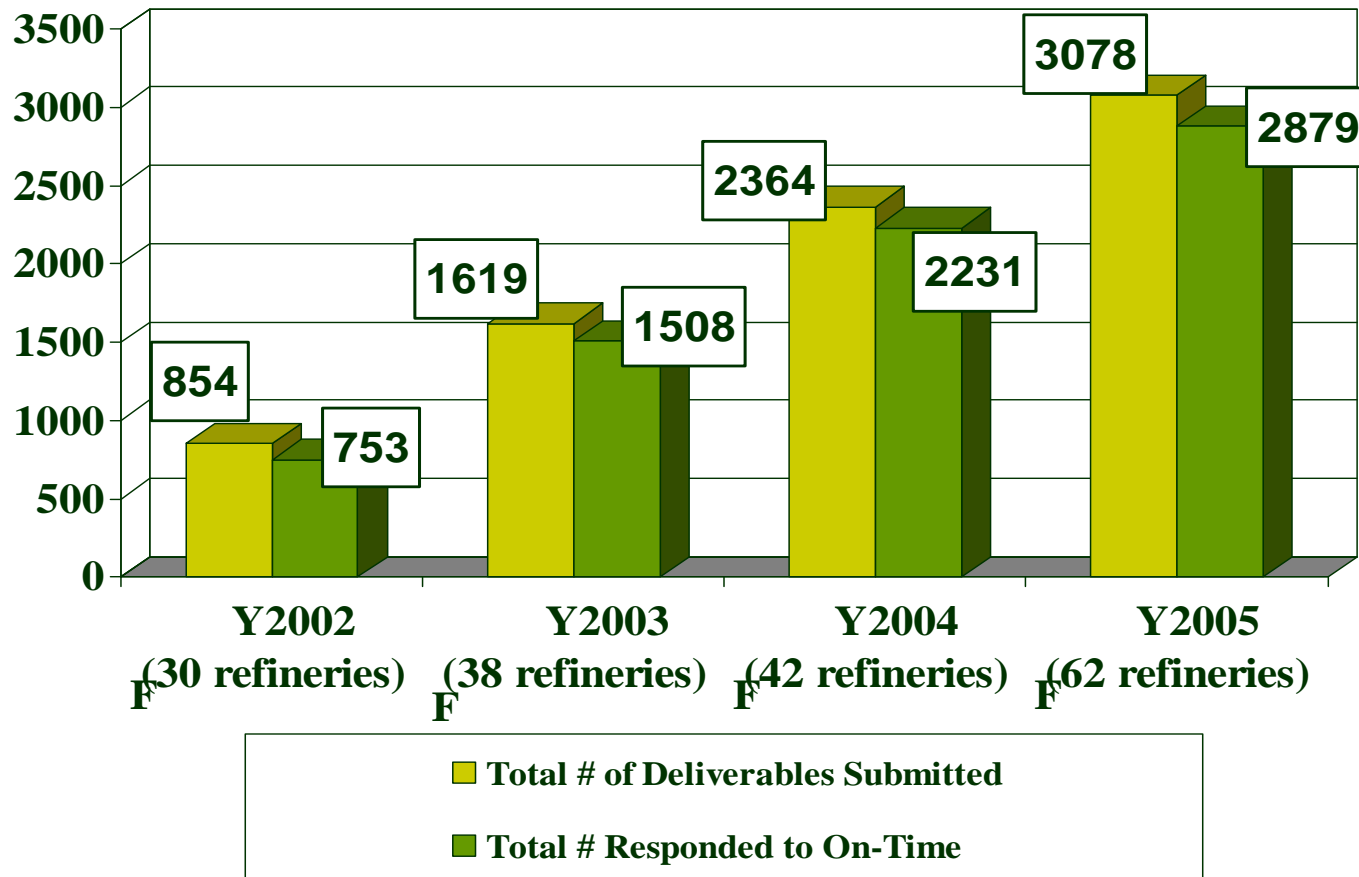
Emissions Monitoring

- Develop and implement a program to achieve and maintain compliance with state and federal LDAR regulations (e.g., 40 CFR Part 60 Subparts VV and GGG)
- Program must include:
 - Refinery wide leak rate goal
 - Identification of all equipment with the potential to leak
 - Procedures to identify, repair, and track leaky equipment
 - LDAR audits

Implementation of Decrees

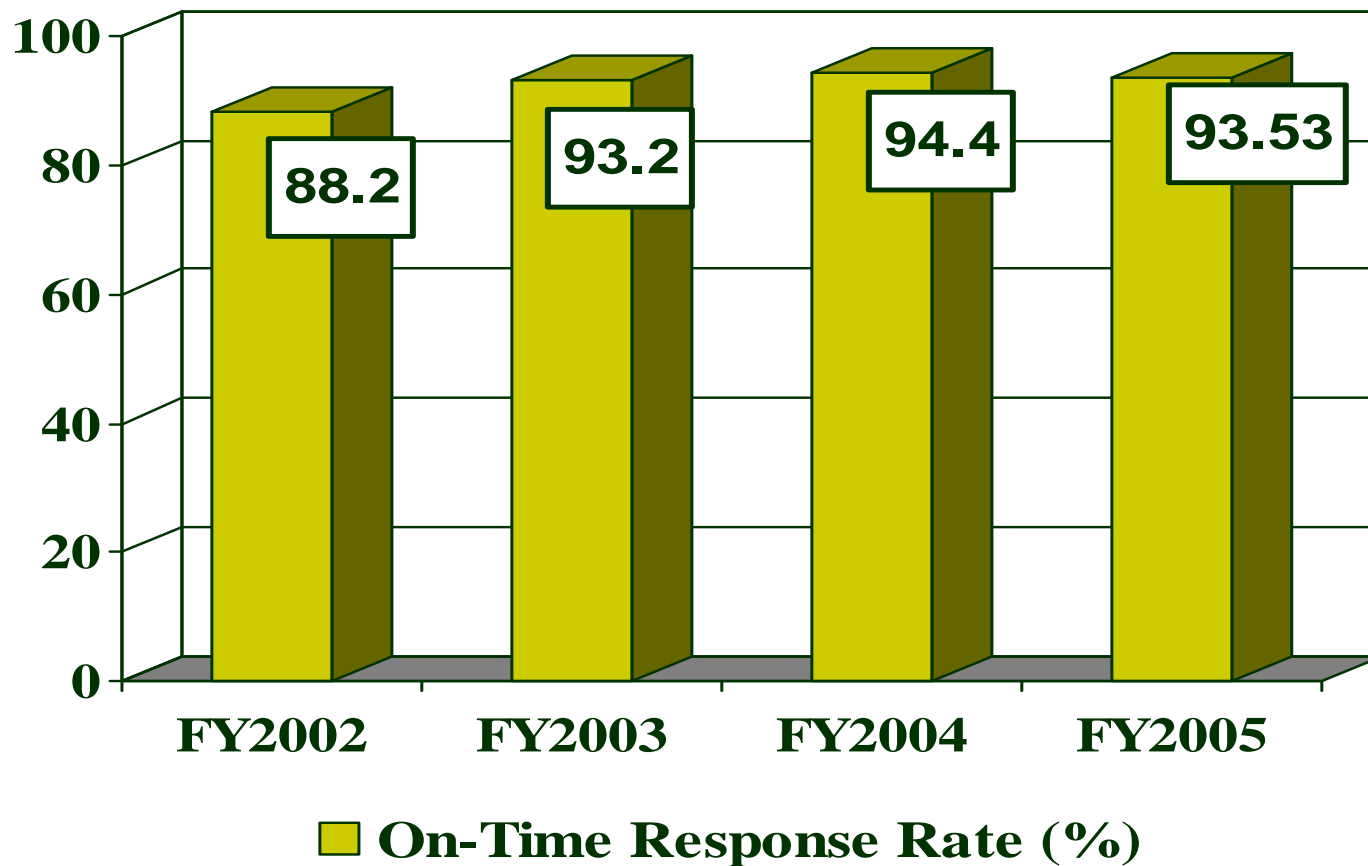
Volume of “Deliverables” Submitted under Decrees

“Deliverables” Include Reports of Flaring Incidents and Corrective Action, Biennial Reporting, etc.



Implementation of Decrees

Improvements in EPA Responsiveness





Next Steps

- **Continue work toward achieving goal of 80% of refining industry covered by global settlement, referral to DOJ, or filed enforcement action.**
- **Negotiations currently ongoing with refiners representing approximately 20% of industry**
- **Maintain focus on implementation of Consent Decrees to achieve expected emissions reductions.**



Link and Contact Information

- **EPA National Petroleum Refinery Initiative (NPRI) Website:**
www.epa.gov/compliance/npriresources
- **EPA Headquarters Technical Contact: Patrick Foley, Senior Environmental Engineer, (202) 564-7978**
- **EPA Headquarters Legal Contact: James Jackson, Senior Attorney Advisor, (202) 564-2002**